



Your Personal Exams Guide



NDA



CDS



SSC CGL



CBSE UGC NET



IAS



SSC CHSL



CTET



MPSC



AFCAT



CSIR UDC NET



IBPS PO



UP POLICE



SSC MTS



SBI PO



BPSC



UP TET



IBPS RRB



IBPS CLERK



IES



UPSC CAPF



SSC Stenogr..



RRB NTPC



SSC GD



RBI GRADE B



RBI Assistant



DSSSB

AP Police SI 2018 Prelims Official paper 1

Total Time: 3 Hour

Total Marks: 100

Instructions

SI No.	Section Name	No. of Question	Maximum Marks	Negative Marks	Positive Marks
1	Full Test	100	100	0	1

- 1.) A total of 180 minutes is allotted for the examination.
- 2.) The server will set your clock for you. In the top right corner of your screen, a countdown timer will display the remaining time for you to complete the exam. Once the timer reaches zero, the examination will end automatically. The paper need not be submitted when your timer reaches zero.
- 3.) There will, however, be sectional timing for this exam. You will have to complete each section within the specified time limit. Before moving on to the next section, you must complete the current one within the time limits.

Your Personal Exams Guide

Full Test

1. Let the sum of 3 numbers be 13680. If the first number is $(\frac{3}{5})$ of the third number and the ratio between the second and the third numbers is 4 : 7, then the first number is (+1)
 - a. 3,600
 - b. 3,780
 - c. 4,280
 - d. 4,800

2. A boy distributes chocolates among four of his friends in the ratio $\frac{1}{3} : \frac{1}{4} : \frac{1}{5} : \frac{1}{6}$. The minimum number of chocolates this boy should have, in order to do this distribution is (+1)
 - a. 60
 - b. 114
 - c. 57
 - d. 54

3. A person gave $\frac{2}{5}$ of his property to his elder son and 30% of his property to his younger son. He shared the rest of the property among his three daughters in the ratio 3 : 5 : 2. If one of his sons got Rs. 20,000 more than the other, then the largest share among the shares of the daughters is (+1)
 - a. Rs. 18,000
 - b. Rs. 22,000

c. Rs. 24,000

d. Rs. 30,000

-
4. The ratio of the present prices of two bicycles is 2 : 3. Two years later, when the price of the first is increased by 15% and that of the second by Rs. 475, the ratio of their prices becomes 3 : 5. The present price of the first bicycle in rupees is (+1)

a. 1090

b. 1120

c. 1140

d. 1280

-
5. If the difference between the yearly compound interest for 2 years and simple interest for 3 years on a certain amount at 10% per annum is Rs. 1080, then that amount (in Rs.) is (+1)

a. 10,260

b. 10,800

c. 11,400

d. 12,000

-
6. A person borrowed some money for simple interest and the interest paid is $\frac{4}{9}^{th}$ of the principal. If the magnitudes of the interest rate and the time period are equal, then the rate of interest per annum is (+1)

a. $6\frac{2}{3}\%$

b. $8\frac{1}{3}\%$

c. $12\frac{1}{2}\%$

d. $16\frac{2}{3}\%$

-
7. A person borrowed a sum for simple interest at a certain rate for a period of 3 years. If he has taken it for 2% higher rate, he would have to pay Rs. 720 more. Then the sum (in Rs.) borrowed by him is (+1)

a. 12,000

b. 10,800

c. 9,600

d. 6,000

-
8. Sunil borrowed Rs. 25,000 from a moneylender at 20% compound interest per annum. At the end of each year, he repaid Rs. 5,000. The amount he still owes to the lender after paying three such installments is (in Rs.) (+1)

a. 25,000

b. 22,500

c. 21,600

d. 20,000

-
9. The number of times the number-key buttons of a type writer have to be pressed in order to type the first 300 natural numbers is (+1)

- a. 792
 - b. 684
 - c. 762
 - d. 300
-

10. The number of zeros occurring after the last significant (non zero) digit in the product of $75 \times 60 \times 48 \times 35 \times 30 \times 24 \times 18 \times 10 \times 5$ is (+1)

- a. 5
 - b. 6
 - c. 7
 - d. 9
-

11. The sum of the distinct primes that divide 5400 is (+1)

- a. 10
 - b. 15
 - c. 17
 - d. 28
-

12. The number, among the following, that divides $7^{12} - 2^{24}$ is (+1)

- a. 32
- b. 33

c. 34

d. 35

-
13. The average age of two sons and their father is greater than the average age of the two sons and their mother by 4 years. If the average age of these four persons is 19 years and the average age of the two sons is 6 years, then the ratio of the ages between the father and mother is **(+1)**

a. 19 : 13

b. 18 : 17

c. 17 : 13

d. 16 : 13

-
14. The average weight of A, B, C is 84 kg. If D joins this group, their average weight becomes 80 kg. If another man E who weighs 3 kg more than D replaces A then, the average weight of B, C, D, E becomes 79 kg. The weight of A (in kg), is **(+1)**

a. 68

b. 72

c. 75

d. 80

-
15. A trader bought two cycles for a sum of Rs. 7,800. He sold the first one at 4% profit and the second one at 9% loss. Later he found that each cycle is sold for the same price. Then the cost price (in Rs.) of that cycle which is sold for loss is **(+1)**

a. 4,560

b. 3,240

c. 4,160

d. 3,640

16. A person sold an article for Rs. 144, thereby gaining a profit percent equal to the cost price. Then the cost price of that article (in Rs.) is (+1)

a. 64

b. 75

c. 80

d. 90

17. The cost price of a pair of shoes is Rs. 800. Its marked price is Rs. 1060. If the shopkeeper suffered a loss of 12% in the festival sale, the approximate discount percent he offered was (+1)

a. 36.2

b. 33.6

c. 32

d. 26

18. P sold an article to Q for 25% profit, Q sold it to R for 15% loss, and R sold it to S for 20% profit. If S bought it for Rs. 204, P's purchase price of that article (in Rs.) is (+1)

a. 160

b. 175

c. 240

d. 310

19. If a reduction of Rs. 3 is given on an article and sold it to Rs. 42, then the percentage of discount allowed is (+1)

a. 14

b. 9

c. $8\frac{1}{3}$

d. $6\frac{2}{3}$

20. After allowing a discount of 20% on the marked price of an article, a shopkeeper makes a profit of 12%. What percent is its marked price above its cost price? (+1)

a. 40

b. 32

c. 25

d. 16

21. A train of length 180 meters moving with uniform speed crosses a telephone pole in 18 seconds. Due to detachment of some coaches, its length is reduced to 150 meters. Now the time (in seconds) taken by this train moving with same speed to cross a bridge of length 120 meters is (+1)

- a. 27
 - b. 25
 - c. 22
 - d. 15
-

22. In a 100 meters running race, if A defeats B in 10 meters and defeats C in 28 meters, then in how many meters B defeats C? (+1)

- a. 18
 - b. 20
 - c. 24
 - d. 30
-

23. A certain number of men will complete a work in 60 days. If 8 men join them, it will be finished earlier by 15 days. How many men were there originally? (+1)

- a. 24
 - b. 22
 - c. 20
 - d. 18
-

24. 12 men and 16 women can do a piece of work in 6 days and 15 men and 30 women can do it in 4 days. The time (in days) needed for 6 men and 12 women to complete it is (+1)

- a. 14
- b. 12
- c. 10
- d. 9

25. Chandu takes twice as much time as Avinash and thrice as Satish to finish a piece of work. Together they can finish the work in a day. Chandu started that work and after 2 days he left it. The time (in hours) needed for Avinash and Satish to finish the remaining work together is: (+1)

- a. $26\frac{1}{5}$
- b. 24
- c. $22\frac{1}{3}$
- d. $19\frac{1}{5}$

26. The angle between the two hands of a clock at 9:40 hours is (+1)

- a. 50°
- b. 88°
- c. 75°
- d. 68°

27. The hands of a clock point in opposite directions between 4 O' clock and 5 O' clock at (+1)

- a. $56\frac{4}{11}$ minutes past 4 O' clock
 - b. $54\frac{6}{11}$ minutes past 4 O' clock
 - c. $50\frac{4}{11}$ minutes past 4 O' clock
 - d. 45 minutes past 4 O' clock
-

28. If the English new year day of the year 1991 was Tuesday, then what day of the week is 26th January 1998? (+1)

- a. Sunday
 - b. Monday
 - c. Saturday
 - d. Friday
-

29. A and B started a business with investments in the ratio 4 : 5. After 3 months, A withdrew 25% of his capital and B withdrew 20% of his capital. If the profit at the end of the year is Rs. 9000, then B's share of the profit (in rupees) is (+1)

- a. 3600
 - b. 4200
 - c. 4800
 - d. 5100
-

30. A, B and C started a business with capital that are in the ratio 8 : 9 : 10. After 3 months B contributed another $\frac{1}{3}$ of his capital and 3 months there after, C withdrew $\frac{1}{5}$ of his capital. In the annual profit of Rs. 2,37,300, the C's share (in rupees) is (+1)
- a. 83,000
 - b. 81,600
 - c. 75,600
 - d. 67,300

31. If $4^x - 4^{(x-1)} = 24$ then $(2x)^x =$ (+1)
- a. 3^5
 - b. $2^{5/2}$
 - c. $4^{5/2}$
 - d. $5^{5/2}$

32. $18 - [5 - 66 + 2(7 - \overline{8 - 5})] =$ (+1)
- a. 71
 - b. 79
 - c. 97
 - d. 102

33. $55.005 + 0.0155 + 5055.05555 + 50.150 - 59.91319 - 5100.31286 =$ (+1)

- a. 5010.31286
- b. 5011.28163
- c. 5100.31865
- d. 0

34. The number of ordered pairs of positive integers having 30 as their L.C.M. is (+1)

- a. 30
- b. 27
- c. 20
- d. 15

35. The least multiple of 7 which leaves the remainder 4 when divided by each of 6, 9, 15 and 18 is (+1)

- a. 182
- b. 350
- c. 364
- d. 455

36. The sum of two positive integers is 594. Their H.C.F. is 33. The number of pairs of such numbers satisfying these conditions is (+1)

- a. 2
- b. 3
- c. 4
- d. 5

37. The greatest value of k such that each one of the numbers $\frac{4}{3k}$, $\frac{20}{42k}$, $\frac{8}{6k}$ and $\frac{36}{63k}$ is an integer is (+1)

- a. $\frac{4}{126}$
- b. $\frac{4}{8}$
- c. $\frac{4}{36}$
- d. $\frac{4}{42}$

38. AC is the diameter of the circle and is a diagonal of the quadrilateral ABCD inscribed in it whose sides are $AB = 30$, $CD = 10$, $BC = 40$ units. Then the area (in sq. units) of that quadrilateral is (+1)

- a. 1200
- b. $200\sqrt{6}$
- c. $100(6 + \sqrt{6})$
- d. $100(3 + \sqrt{3})$

39. A circle is inscribed in an equilateral triangle. If the area of the circle is 462 cm^2 , (+1)
then the perimeter of that triangle (in cms) is

- a. 196
- b. 172
- c. 132
- d. 126

40. The length, breadth and height of a room are in the ratio $3 : 2 : 1$ and the sum of (+1)
their dimensions is 18 meters. If the walls and the ceiling of this room is to be
painted at a rate of Rs. 15 per Sq. meter, the expenditure involved (in Rs.) is

- a. 1350
- b. 1840
- c. 1960
- d. 2160

41. In $\triangle ABC$, $\angle ACB = 90^\circ$ and CD is perpendicular to AB . If $AD = 4 \text{ cm}$ and $BD = 9 \text{ cm}$, (+1)
then $CD =$

- a. 6 cm
- b. 5 cm
- c. 3 cm
- d. 8 cm

42. A hollow cylinder with diameter 6 cm is partially filled with water. A sphere of 3 cm diameter is gently dropped into the cylinder. If it is immersed in water, then the water in the cylinder raises to a further height of (+1)

- a. 3 cm
- b. 2 cm
- c. 4 cm
- d. $\frac{1}{2}$ cm

43. A hollow iron roller of length 63 cm and having girth 440 cm has a thickness of 4 cm. The volume (in cubic cms) of metal used for making it, is (+1)

- a. 116740
- b. 108412
- c. 107712
- d. 105692

44. A solid cone of height 9 cm with base diameter 18 cm is cut out from a wooden solid sphere of radius 9 cm. The percentage of wood that is wasted in this process is (+1)

- a. 75
- b. 67
- c. 65
- d. 60

45. Two pipes can separately fill a tank in 20 hrs and 30 hrs respectively. Both these pipes are opened simultaneously and after the tank is $\frac{1}{3}$ full, a leak develops in the tank through which $\frac{1}{3}$ of water supplied thereafter by both pipes gets leaked out. The total time (in hours) taken to fill the tank is (+1)

- a. 18
- b. 16
- c. 15
- d. 12

46. A pipe can fill a cistern in 12 minutes while a second pipe fills it in 15 minutes. But a third pipe can empty that completely filled cistern in 6 minutes. The first two pipes are kept open for 5 minutes initially and then the third one is also opened. Then the further time (in minutes) taken to empty that cistern is (+1)

- a. 30
- b. 40
- c. 45
- d. 50

47. Suresh's income is Rs. 40,000 per month. His income get increased by 8%. Simultaneously his expenditure is increased by 12% and his savings is decreased by 4%. His initial saving (in Rs.) is (+1)

- a. 10,000
- b. 9,600

c. 9,000

d. 8,400

48. The milk and water in vessel A and B are in the ratios 4 : 3 and 2 : 3 respectively. (+1)
The ratio in which the liquids in both vessels are to be mixed to obtain a new mixture in an empty vessel C to consist of half milk and half water, is

a. 8 : 4

b. 7 : 5

c. 4 : 3

d. 2 : 3

49. The average marks obtained by 120 candidates in a certain examination is 35. If (+1)
the average marks of passed candidates is 39 and the failed candidates is 15,
then the number of candidates who passed the examination is

a. 85

b. 90

c. 95

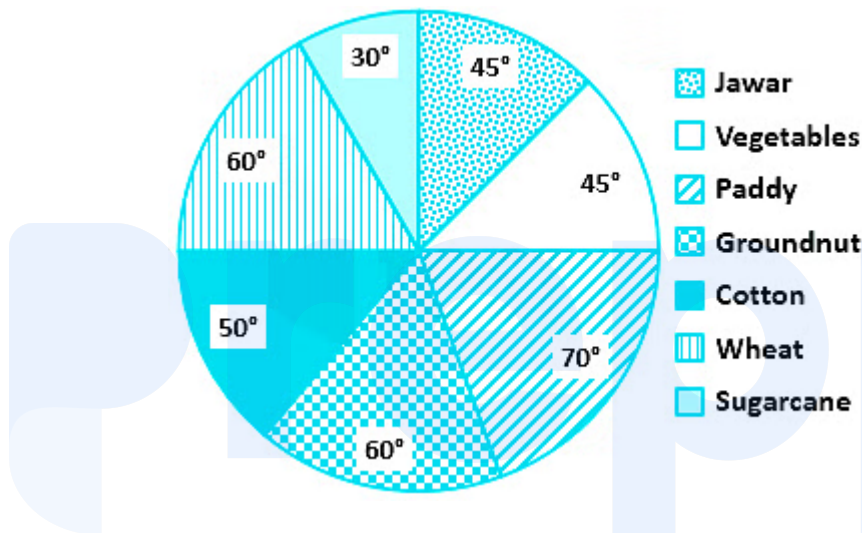
d. 100

50. The sum of 5 consecutive odd numbers is 195. The second lowest number of (+1)
this series is 5 less than the second highest number of another series of 5
consecutive even numbers. Then 65% of the middle number of that series of
consecutive even numbers is

a. 24

- b. 22
- c. 25
- d. 26

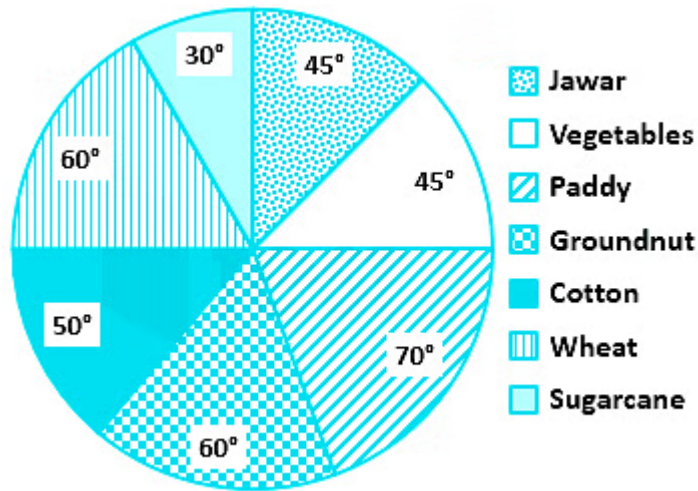
51. Study the following diagram and use it to answer the following questions. 'Pie diagram' given below shows the distribution of land to various food crops. (+1)



The percentage of area allocated to Jawar and Vegetables put together is

- a. 50
- b. 35
- c. 30
- d. 25

52. Study the following diagram and use it to answer the following questions. 'Pie diagram' given below shows the distribution of land to various food crops. (+1)

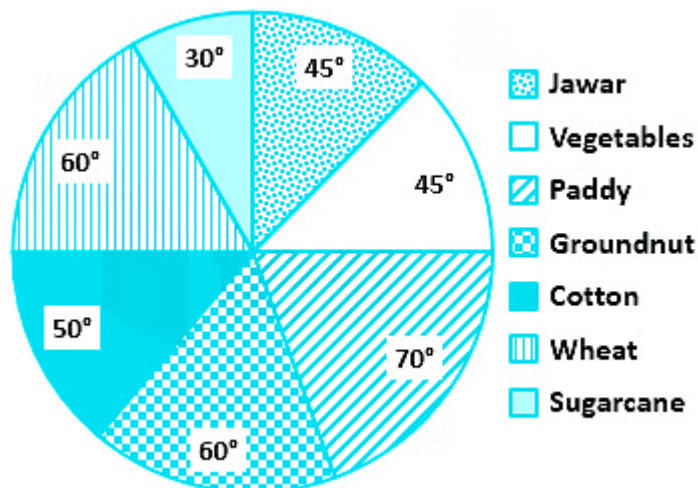


The ratio of the land allocated for Paddy to the land allocated for vegetables is

- a. 7 : 3
- b. 14 : 9
- c. 5 : 9
- d. 7 : 9

53. Study the following diagram and use it to answer the following questions. 'Pie diagram' given below shows the distribution of land to various food crops.

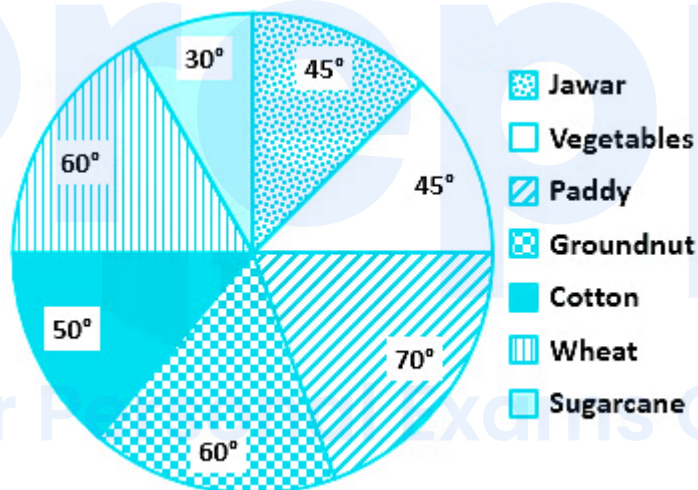
(+1)



If a hectares of land is allocated for Cotton and b hectares of land allocated to Groundnut; and if $\frac{a}{b} = k$, then $6k =$

- a. 5
- b. 3
- c. 2
- d. 1

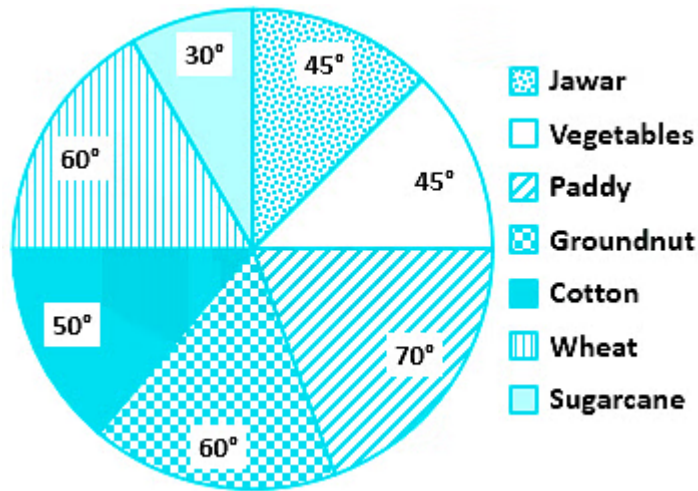
54. Study the following diagram and use it to answer the following questions. 'Pie diagram' given below shows the distribution of land to various food crops. (+1)



If the land allocated to Vegetables is 120 acres, then the land allocated to Wheat (in acres) is

- a. 140
- b. 150
- c. 155
- d. 160

55. Study the following diagram and use it to answer the following questions. 'Pie diagram' given below shows the distribution of land to various food crops. (+1)



If the land allocated for Cotton is 200 hectares more than the land allocated for Jawar, then the land (in hectares) allocated for Paddy is

- a. 2800
- b. 3200
- c. 3600
- d. 4200

56. To answer the questions, read the following information and choose the correct option. (+1)

In a group of five persons A, B, C, D, E

- (i) B and C are bright in Mathematics and Geography
- (ii) A and C are bright in Mathematics and History
- (iii) B and D are bright in Politics and Geography
- (iv) D and E are bright in Politics and Botany

(v) E is bright in Botany, History and Politics

Choose the bright in Politics, Mathematics and Geography?

- a. A
- b. B
- c. C
- d. D

57. To answer the questions, read the following information and choose the correct option. (+1)

In a group of five persons A, B, C, D, E

- (i) B and C are bright in Mathematics and Geography
- (ii) A and C are bright in Mathematics and History
- (iii) B and D are bright in Politics and Geography
- (iv) D and E are bright in Politics and Botany
- (v) E is bright in Botany, History and Politics

Who is bright in Mathematics and History but not in Geography?

- a. C
- b. E
- c. A
- d. B

58. All the faces of a solid cube are painted with yellow colour. If this cube is cut along its faces into 125 identical cubes, the number of such cubes that will have exactly two coloured faces, is (+1)
- a. 12
- b. 4
- c. 8
- d. 36

59. The exact die among the following options that can be obtained by folding the sheet given in the following figure is (+1)

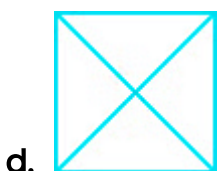
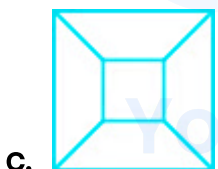


- a.
- b.
- c.



60. One of the hidden figure, in the following figure is

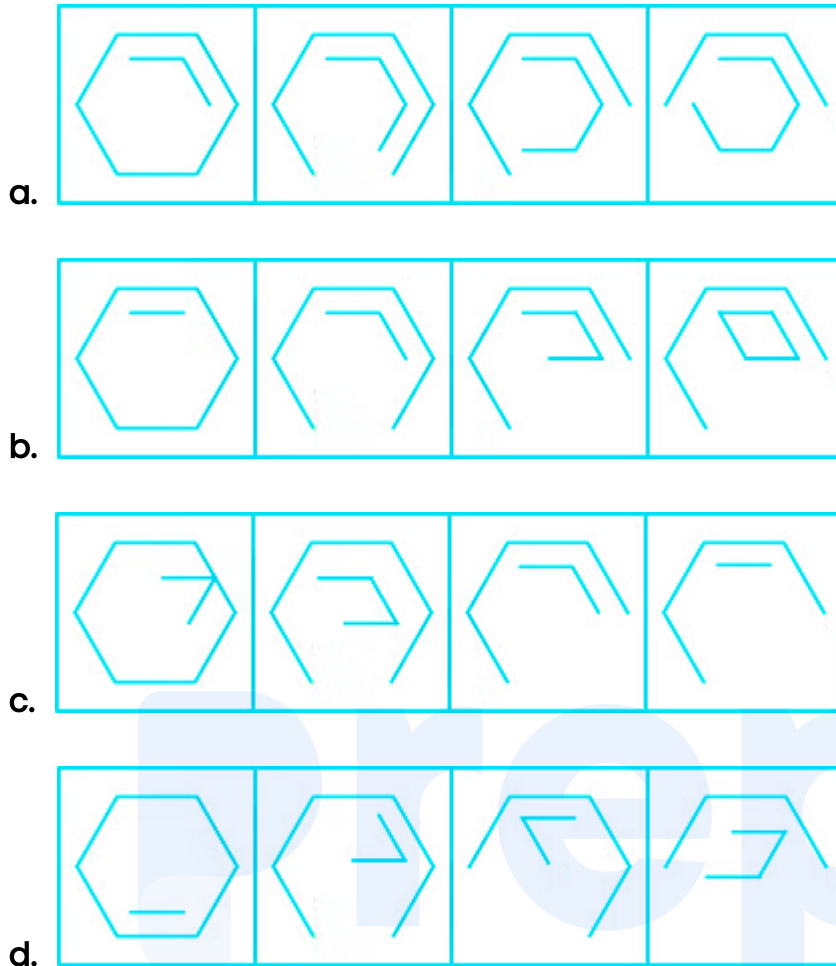
(+1)



61. Which one of the following options follows the given rule?

(+1)

Rule: The closed figure inside the first cell goes on losing its sides one at a time and the open figure inside the first cell goes on gaining its sides one at a time.



62. If $AXB = A^2 - B^2$ and $AYB = A^2 + B^2$, then the value of $(9X6) \div (8Y5)$ is (+1)
- a. 3645
- b. 3546
- c. 3456
- d. 6345

63. The count of numbers in the following sequence such that each of which is immediately preceded by a consonant and immediately followed by a symbol is (+1)

R * T J L 2 \$ D = M # 8 C % B < K 1 & A W ? P E + Q @ 7 F 6

- a. 1
- b. 3
- c. 4
- d. 2

64. How many consonants are there in the following sequence, each of which is immediately preceded by a consonant but not immediately followed by a symbol? (+1)

N 8 J * 4 W M 1 U % K 2 # B D 7 Q I T 3 Δ P A D 5 E R

- a. 1
- b. 2
- c. 3
- d. 4

65. In question, a sequence with one blank is given in each question. Identify the correct answer among the given options to fill that blank. (+1)

448, 220, 106, 49, _____, 6.25

- a. 17.5
- b. 20.5
- c. 12.5
- d. 9.25

66. In question, a sequence with one blank is given in each question. Identify the correct answer among the given options to fill that blank. (+1)

7, 151, 251, 315, _____

- a. 351
- b. 417
- c. 513
- d. 619

67. In question, a sequence with one blank is given in each question. Identify the correct answer among the given options to fill that blank. (+1)

142, 145, 140, 133, 136, 131, 124, 127, _____

- a. 126
- b. 125
- c. 123
- d. 122

68. In question, a sequence with one blank is given in each question. Identify the correct answer among the given options to fill that blank. (+1)

A, CD, GHI, _____, UVWXY

- a. NOPQ
- b. KLMN

c. MNOP

d. OPQR

-
69. In question, a sequence with one blank is given in each question. Identify the correct answer among the given options to fill that blank. (+1)

USR, QON, MKJ, _____, ECB.

a. IGE

b. IFE

c. IFG

d. IGF

-
70. In the question, there must be 4 entries and there must be a definite relation between the first two entries. The same relation also holds between the third and fourth entries. Fill in the blanks with correct option. (+1)

6 : _____ :: 5 : 124

a. 146

b. 164

c. 215

d. 175

-
71. In the following question, select the related word from the given alternatives. (+1)

KNQT : MQUY :: ADGJ : _____

- a. DGEF
- b. MPVW
- c. BEHK
- d. CGKO

72. In the question, there must be 4 entries and there must be a definite relation between the first two entries. The same relation also holds between the third and fourth entries. Fill in the blanks with the correct option. (+1)

Ample : Enormous :: _____ : _____

- a. Cat : Tiger
- b. Warmth : Frost
- c. Stout : Lusty
- d. Rich : Prince

73. The question is followed by two statements I and II. (+1)

For real numbers a and b , is $|a| > |b|$?

- (I) $a > b$
- (II) $a = b$

- a. Statement I alone can give the answer to the question
- b. Statement II alone can give the answer to the question
- c. Statement I and II together only can give the answer to the question

- d. Statements I and II together also cannot answer the question and additional information is necessary

74. The question is followed by two statements I and II.

(+1)

If n exactly divisible by 120?

(I) n is the product of five consecutive integers

(II) n is divisible by 6 and 20

- a. Statement I alone can give the answer to the question
- b. Statement II alone can give the answer to the question
- c. Statement I and II together only can give the answer to the question
- d. Statements I and II together also cannot answer the question and additional information is necessary

75. In the question below consists of a question and two statements numbered I and II given below it. You have to decide whether the data provided in the statements are sufficient to answer the question. Read both statements and give the answer.

(+1)

What is the area of $\triangle DEF$?

(I) D, E, F are mid-points of the sides of $\triangle ABC$

(II) Area of $\triangle ABC$ is 10 sq. units.

- a. Statement I alone can give the answer to the question
- b. Statement II alone can give the answer to the question
- c. Statement I and II together only can give the answer to the question

- d. Statements I and II together also cannot answer the question and additional information is necessary

76. The question is followed by two statements I and II.

(+1)

If $a_0 = 5$, what is the value of $a_0 + a_1 + \dots + a_7$?

(I) $a_n = 3.a_{n-1}$, for $1 \leq n \leq 7$

(II) $a_n > 0$, for $1 \leq n \leq 7$

- a. Statement I alone can give the answer to the question
- b. Statement II alone can give the answer to the question
- c. Statement I and II together only can give the answer to the question
- d. Statements I and II together also cannot answer the question and additional information is necessary

77. The question is followed by two statements I and II.

(+1)

What is the profit percentage?

(I) The cost price of 8 books is the selling price of 6 books

(II) Each book is sold at Rs. 72

- a. Statement I alone can give the answer to the question
- b. Statement II alone can give the answer to the question
- c. Statement I and II together only can give the answer to the question
- d. Statements I and II together also cannot answer the question and additional information is necessary

78. The question is followed by two statements I and II.

(+1)

For $x, y \in \mathbb{Z}$, what is the value of $4x^3y - \frac{4x^3}{y}$?

(I) $x = 2$

(II) $y^2 = 4$

- a. Statement I alone can give the answer to the question
- b. Statement II alone can give the answer to the question
- c. Statement I and II together only can give the answer to the question
- d. Statements I and II together also cannot answer the question and additional information is necessary

79. The question is followed by two statements I and II.

(+1)

How is A related to B?

(I) B is the brother of C and C is the son of A.

(II) A is the husband of D and D is the mother of B.

- a. Statement I alone can give the answer to the question
- b. Statement II alone can give the answer to the question
- c. Statement I and II together only can give the answer to the question
- d. Statements I and II together also cannot answer the question and additional information is necessary

80. The question has two statements labeled as Assertion (A) and Reason (R). (+1)
Choose the correct option from options given below.

Assertion (A): India has a tropical monsoon type climate

Reason (R): India is located exactly between the tropical latitudes

- a. Both (A) and (R) are true and (R) is the correct explanation of (A)
- b. Both (A) and (R) are true but (R) is not the correct explanation of (A)
- c. (A) is true but (R) is false
- d. (A) is false and (R) is true

-
81. The question has two statements labeled as Assertion (A) and Reason (R). (+1)
Choose the correct option from options given below.

Assertion (A): Food materials should not have be soaked in water for a long time.

Reason (R): Washing leads to loss of Vitamin A and Vitamin D from the food stuff

- a. Both (A) and (R) are true and (R) is the correct explanation of (A)
- b. Both (A) and (R) are true but (R) is not the correct explanation of (A)
- c. (A) is true but (R) is false
- d. (A) is false and (R) is true

-
82. The question has two statements labeled as Assertion (A) and Reason (R). (+1)
Choose the correct option from options given below.

Assertion (A): Red colour of blood is due to haemoglobin

Reason (R): Haemoglobin is a red pigment.

- a. Both (A) and (R) are true and (R) is the correct explanation of (A)
- b. Both (A) and (R) are true but (R) is not the correct explanation of (A)
- c. (A) is true but (R) is false
- d. (A) is false and (R) is true

83. In the following question, find the odd term from the give choices and write it as your answer. **(+1)**

- a. Eagle
- b. Peacock
- c. Ostrich
- d. Hawk

84. In the following question, find the odd term from the give choices and write it as your answer. **(+1)**

- a. September
- b. May
- c. June
- d. November

85. In the following question, find the odd term from the give choices and write it as your answer. **(+1)**

- a. EJO
 - b. HMR
 - c. DIN
 - d. LPT
-

86. In the following question, find the odd term from the give choices and write it as your answer. **(+1)**

- a. 273
 - b. 133
 - c. 155
 - d. 221
-

87. In the following question, find the odd term from the give choices and write it as your answer. **(+1)**

- a. 6
 - b. 20
 - c. 42
 - d. 74
-

88. Anil walks 20 meters from his school towards North. He then turns left, walks 30 meters, again turns left and walks 20 meters. He then turns right and walks 40 meters. The nearest distance and the direction from the school to his present position, is (+1)
- a. 50 meters, North
 - b. 70 meters, South
 - c. 70 meters, West
 - d. 50 meters, West
-
89. Sunil is facing East. He turned 100° in the clockwise direction and then turned 145° in the anti clock wise direction. In which direction is Sunil facing now? (+1)
- a. South East
 - b. North East
 - c. North West
 - d. South
-
90. In a certain code, if "RECTANGLE" is coded as "IVXGZMTOV", then the code for "SPHERE" is (+1)
- a. HKSVJV
 - b. HTKVIV
 - c. HKTIVV
 - d. HKSVIV

91. In a certain code, if PINK = 50 and RED = 27, then BLACK =

(+1)

- a. 41
- b. 32
- c. 29
- d. 28

92. If strawberry is called apple, apple is called grape, grape is called mango, mango is called pomegranate and pomegranate is called guava, which of the following is a yellow fruit?

(+1)

- a. Mango
- b. Pomegranate
- c. Grape
- d. Guava

93. In a certain code if SILVER is written as MJTSFW and FORM is written as PGNS, then the code for COVALENT is

(+1)

- a. BPWUODFM
 - b. BWPDUOFM
 - c. BWPUDOMF
 - d. FMBWPDUO
-

94. If 'DECK' is written as QRPX in a certain code, then the code for LIME is **(+1)**

- a. VYRZ
- b. RZVY
- c. VZRY
- d. YVZR

95. A man said to a woman, "The only son of your brother is the brother of my wife". **(+1)**
Then that woman is related to the wife of that man as

- a. Aunt
- b. Sister
- c. Mother
- d. Grand mother

96. Read the information carefully and answer the following questions. **(+1)**

A health club gives 50% concession in their subscription to those who belong to any one of the following categories.

- (i) Children of age between 5 and 12 years from low income group.
- (ii) Female upto 25 years of age, who represent in games and sports at national level
- (iii) Senior citizens of age above 60 years.
- (iv) Physically challenged persons.

The candidate will be referred to the secretary if he/she does not belong to any of the above category but donates blood once in a year:

Anthony, who is about to complete 60 years, donates blood once in a year.

- a. The candidate is eligible for concession
- b. The candidate is referred to the secretary
- c. The candidate is not eligible for concession
- d. The data is inadequate.

97. Read the information carefully and answer the following questions.

(+1)

A health club gives 50% concession in their subscription to those who belong to any one of the following categories.

- (i) Children of age between 5 and 12 years from low income group.
- (ii) Female upto 25 years of age, who represent in games and sports at national level
- (iii) Senior citizens of age above 60 years.
- (iv) Physically challenged persons.

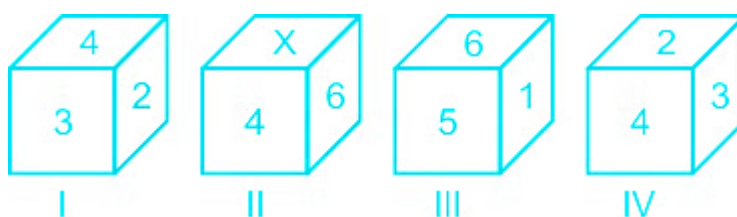
The candidate will be referred to the secretary if he/she does not belong to any of the above category but donates blood once in a year:

Anitha is a national player in Table Tennis.

- a. The candidate is eligible for concession
- b. The candidate is referred to the secretary
- c. The candidate is not eligible for concession

d. The data is inadequate.

98. Given below are the different positions of a die. The number that comes in the place of X is (+1)



- a. 3
- b. 5
- c. 2
- d. 1

99. Read the information given below and answer the questions. (+1)

A, B, C, D, E, F, G and H are eight friends sitting around a circular table facing towards its centre as follows:

- (i) H is on the immediate left of A but is not a neighbour of D or E
- (ii) F is on the immediate right of B and G is a neighbour of E.
- (iii) C is in between E and F

The position of D is

- a. On immediate right of B
- b. Second to the right of F
- c. On the immediate left of B

d. Between B and F

100. Read the information given below and answer the questions.

(+1)

A, B, C, D, E, F, G and H are eight friends sitting around a circular table facing towards its centre as follows:

- (i) H is on the immediate left of A but is not a neighbour of D or E
- (ii) F is on the immediate right of B and G is a neighbour of E.
- (iii) C is in between E and F

Which of the following is true?

- a. E is between F and B
- b. F is a neighbour of G
- c. G is in between H and E
- d. H is between A and D

Your Personal Exams Guide

Answers

1. Answer: b

Explanation:

★ Shortcut Trick

Let the 3 numbers be 'X, Y, & Z'

$$X : Z = 3 : 5$$

$$Y : Z = 4 : 7$$

$$\Rightarrow X : Y : Z = 21 : 20 : 35$$

$\Rightarrow$ The value of X will be a multiple of 7 & from options only **3780** is a multiple of 7.

$\therefore$ The required first number will be **3780**.

Traditional Method:

Given:

The Sum of 3 numbers is 13680.

The first number is $(\frac{3}{5})$ of the third number

Ratio between the second and the third numbers is 4 : 7.

Concept used:

by the 'Ratio' method.

Calculation:

Let the 3 numbers be 'X, Y, Z'

According to the question,

$$\Rightarrow X = (\frac{3}{5}) Z$$

$$\Rightarrow X : Z = 3 : 5 \quad \text{-----(1)}$$

$$\& Y : Z = 4 : 7 \quad \text{-----(2)}$$

To equate Z in both the equation multiply equation (1) by 7 & multiply equation (2) by 5, we get

$$\Rightarrow X : Z = 21 : 35$$

$$\Rightarrow Y : Z = 20 : 35$$

By combining both ratios, we get

$$\Rightarrow X : Y : Z = 21 : 20 : 35$$

Sum of 3 numbers,

$$X + Y + Z = 21k + 20k + 35k = 76k = 13680$$

$$\Rightarrow k = 13680/76$$

$$\Rightarrow k = 180$$

$$\Rightarrow X = 21k = 21 \times 180$$

$$\Rightarrow X = 3780$$

$\therefore$ The required first number is 3780.

2. Answer: c

Explanation:

Given:

The ratio of distribution among friends = $(1/3) : (1/4) : (1/5) : (1/6)$

Concept used:

In order to convert fractional ratio into whole number ratio, multiply each term with LCM of denominators

Calculation:

We first convert the fraction ratio into whole number ratio

Since, LCM of denominators 3, 4, 5, 6 is 60, we multiply the ratio by 60.

On rearranging, the ratio = $(60/3) : (60/4) : (60/5) : (60/6) = 20 : 15 : 12 : 10$

Considering that chocolate is distributed in whole number, the minimum number of chocolates can be when the common ratio is 1.

⇒ The minimum number of chocolates = $20 + 15 + 12 + 10 = 57$

∴ The minimum number of chocolates the boy should have, in order to do this distribution is 57.

3. Answer: d

Explanation:

★ Shortcut Trick

Elder son's share = $2/5 = 40\%$

Younger son's share = 30%

Difference in share = $10\% = \text{Rs. } 20,000$

So, total property was $100\% = 20000 \times 100/10 = \text{Rs. } 2,00,000$

Remaining = $100\% - (40\% + 30\%) = 30\%$ of share

⇒ Remaining = $(30/100) \times 2,00,000$

Daughter with highest share = $5/10$ of $(30/100) \times (2,00,000)$

⇒ Rs. 30,000.

∴ The largest share among the shares of the daughters is Rs. 30,000.

Traditional Method:

Given:

Share of property given to elder son = $\frac{2}{5}$

Share of property given to younger son = 30%

Share among 3 daughters = 3 : 5 : 2

Difference of share between two sons = Rs. 20,000

Formula used:

If A, B, C share in the ratio of $x : y : z$ respectively, then the share of B is $\frac{y}{(x+y+z)}$ of total.

Calculation:

Let the total property value be Rs. x .

Then, the share of elder son = $(\frac{2}{5})x$.

⇒ Share of younger son = 30% of $x = (\frac{30}{100})x = (\frac{3}{10})x$

According to given question,

Difference of share between sons = Rs. 20,000

⇒ $(\frac{2}{5})x - (\frac{3}{10})x = 20000$

⇒ $\frac{x}{10} = 20000$

⇒ $x = 200000$

So, remaining property after sharing between sons = $x - \{(\frac{2}{5})x + (\frac{3}{10})x\} = (\frac{3}{10})x$

⇒ Remaining property = $(\frac{3}{10}) \times 200000 = 60000$

Share of B = $\{5/(3+5+2)\} \times 60000$

$$\Rightarrow (5/10) \times 60000 = 30000$$

$\therefore$ The largest share among the shares of the daughters is Rs. 30,000 .

4. Answer: c

Explanation:

Given:

Ratio of present prices = 2 : 3

Ratio of prices two years later = 3 : 5

Increase in price of 1st bicycle after two years = 15%

Increase in price of 2nd bicycle after two years = Rs. 475

Calculation:

Let present price of first bicycle be '2x' and that of second bicycle be '3x'.

After 2 years,

Price of 1st bicycle = $2x + 2x \times (15/100)$

$$\Rightarrow 2x\{1 + (15x/100)\}$$

$$\Rightarrow 2x \times (23/20) = 23x/10$$

Price of 2nd bicycle = $3x + 475$

According to question,

$$(23x/10) : (3x + 475) = 3 : 5$$

$$\Rightarrow 23x/2 = 3(3x + 475)$$

$$\Rightarrow 23x = 6(3x + 475)$$

$$\Rightarrow 23x - 18x = 2850$$

$$\Rightarrow 5x = 2850$$

$$\Rightarrow x = 570$$

$$\Rightarrow \text{Present price of 1}^{\text{st}} \text{ bicycle} = 2x$$

$$\Rightarrow 2 \times 570 = 1140$$

$\therefore$ The present price of first bicycle is Rs. 1140.

5. Answer: d

Explanation:

Given:

Rate of interest = 10% per annum

Difference between 2 years compound interest and 3 years simple interest = 1080

Formula used:

Simple interest = $\frac{PRT}{100}$,

effective percentage change = $[a + b + (a \times b) \div 100]$,

Concept used:

3 years simple interest = $\frac{PRT}{100} \Rightarrow (P \times 3 \times 10) \div (100) = P \times 30\%$

2 years compound interest = $P \times 21\%$ {effective percentage change = $[a + b + (a \times b) \div 100]$ }

Calculation:

Difference between 3 years simple interest and 2 years compound interest

$$\Rightarrow 30\% - 21\% \Rightarrow 1080$$

$$\Rightarrow 9\% \Rightarrow 120$$

$$\Rightarrow 100\% \Rightarrow 12000$$

$\therefore$ Then that amount (in Rs.) is 12000

6. Answer: a

Explanation:

★ Shortcut Trick

$$\text{Simple interest} = \frac{PRT}{100}$$

$$4 = \frac{(9 \times R^2)}{100}$$

$$(400 \div 9) = R^2$$

$$R = (20 \div 3)$$

$\therefore$ The required rate is 6.67%

Traditional method:

Given:

$$\text{Simple interest, SI} = \left(\frac{4}{9}\right) \times \text{Principal, P}$$

Time, = Rate,

Concept used:

$$\text{SI} = \frac{PRT}{100}$$

Calculation:

Let the rate and the number of years be 'r' and the sum be 'x'

$\therefore$ According to the given conditions,

$$\Rightarrow x/9 = (x \times r \times r)/100$$

$$\Rightarrow r \times r = 400/9$$

$$\Rightarrow r = 20/3$$

$\therefore$ The required rate is 6.67%

7. Answer: a

Explanation:

★ Shortcut Trick

3 years simple interest with 2% higher rate = 6% $\Rightarrow$ 720

$$6\% \Rightarrow 120 \Rightarrow 1\% = 120$$

$$100\% \Rightarrow 12,000 \text{ Rs}$$

$\therefore$ Then the sum borrowed by him is 12000 (in Rs.)

Traditional method:

Given: **Your Personal Exams Guide**

Time periods, = 3 years

Let rate of interest = X%

If he take 2% higher rate than interest rate = (X+2)%

Concept used:

Case 1:

If rate of interest = X

Simple interest for 3 years = $3 \times X = 3X$

Case 2:

If rate of interest = $(X + 2) \times 3 = 3X + 6$

Calculation:

Difference between case 1 and Case 2

$$\Rightarrow (3X+6)\% - (3X)\% = 720$$

$$\Rightarrow 6\% \Rightarrow 720$$

$$\Rightarrow 1\% \Rightarrow 120$$

$$\text{Than } 100\% \Rightarrow 12,000$$

$\therefore$ Then the sum borrowed by him is 12000 (in Rs.)

8. Answer: a

Explanation:

Given:

Principal = Rs. 25000, Rate = 20%

Repaid amount per year = Rs. 5000

Time = 3 years

Formula used:

$$A = P(1 + R/100)^T$$

$$\text{C.I.} = A - P$$

Where,

A = Amount, P = Principal, T = Time

R = Rate, C.I. = Compound interest

Calculation:

$$A = P(1 + R/100)^T$$

After 1 year

$$A = 25000 \times (1 + 20/100)^1$$

$$\Rightarrow A = 25000 \times (6/5)$$

$$\Rightarrow A = 30000$$

Sunil has to pay Rs. 30000 after 1 year but he pays the amount of Rs. 5000

Remaining amount = Rs. 25000

Now, The principal for the second year is Rs. 25000.

After the end of the 2nd year,

$$\Rightarrow A = 25000 \times (1 + 20/100)^1$$

$$\Rightarrow A = 25000 \times (6/5)$$

$$\Rightarrow A = 30000$$

Again, Sunil has to pay the amount of Rs. 30000 but he pays only Rs. 5000.

Remaining amount = Rs. 25000

Similarly for the end of 3rd year,

The Remaining amount = Rs. 25000

$\therefore$ The amount he still owes to the lender after paying three such installments is Rs. 25000.

9. Answer: a

Explanation:

Concept used:

The set of numbers $\{1, 2, 3, 4, \dots\}$ are called the natural numbers.

Calculation:

From 1 to 9,

The total numbers = 9

So,

Number of times key buttons of typewriter pressed = 9 ----(1)

From 10 to 99,

Total numbers = 90

Each number has 2 digits, so

⇒ Number of times key buttons of typewriter pressed = 2×90

⇒ Number of times key buttons of typewriter pressed = 180 ----(2)

From 100 to 300,

The total numbers = 201

Each number has 3 digits, so

⇒ Number of times key buttons of typewriter pressed = 201×3

⇒ Number of times key buttons of typewriter pressed = 603 ----(3)

Now, The total number of times key pressed on the typewriter,

⇒ $9 + 180 + 603$

⇒ 792

∴ 792 times the key of a typewriter has to be pressed in order to type the first 300 letters.

10. Answer: c

Explanation:

Given:

The product of numbers $75 \times 60 \times 48 \times 35 \times 30 \times 24 \times 18 \times 10 \times 5$.

Concept used:

The number of zero is equal to the common factor of 2^n and 5^n .

The number of zero = n

Calculation:

Factor of 75 = $1 \times 3 \times 5^2$

The factor of 60 = $1 \times 2^2 \times 3 \times 5$

The factor of 48 = $1 \times 2^4 \times 3$

The factor of 35 = $1 \times 5 \times 7$

The factor of 30 = $1 \times 2 \times 3 \times 5$

The factor of 24 = $1 \times 2^3 \times 3$

The factor of 18 = $1 \times 2 \times 3^2$

The factor of 10 = $1 \times 2 \times 5$

The factor of 5 = 1×5

Now, We know that the number of zero is equal to the common factor of 2 and 5.

The total factor of 2 and 5 = $2^{12} \times 5^7$

Common factors of 2 and 5 = $2^7 \times 5^7$

$\Rightarrow n = 7$

$\therefore$ The number of zero equal to 7.

11. Answer: a

Explanation:

Given:

Number = 5400

Calculation:

The factors of 5400 = $2 \times 2 \times 2 \times 3 \times 3 \times 3 \times 5 \times 5$

From above the distinct prime are 2, 3, and 5.

The sum of distinct prime = $2 + 3 + 5$

$\Rightarrow$ The sum of distinct prime = 10

$\therefore$ The sum of the distinct prime that divides 5400 is 10.

12. Answer: b

Explanation:

Given:

$7^{12} - 2^{24}$

Concept used:

$$a^3 - b^3 = (a - b)(a^2 + ab + b^2)$$

$(a - b)$ divides the $(a^3 - b^3)$.

Calculation:

$$\Rightarrow 7^{12} - 2^{24}$$

$$\Rightarrow (7^4)^3 - (2^8)^3$$

From above equation, the factors are

$$\Rightarrow (7^4) - (2^8)$$

$$\Rightarrow 2401 - 256$$

$$\Rightarrow 2145$$

By checking the option the number 2145 is divisible by option (2)

$$\Rightarrow 2145/33$$

$$\Rightarrow 65$$

$\therefore$ The number that divides $7^{12} - 2^{24}$ is 33.

13. **Answer: a**

Explanation:

Given:

The average age of four persons = 19 years

The average age of the two sons = 6 years

Formula used:

Average = Sum of observations / Total number of observations

Calculation:

Let the ages of mother, father and boys be a , b , c and d respectively.

According to the questions,

Total age of four members = 19×4

$$\Rightarrow a + b + c + d = 76 \text{ years} \quad \text{-----(1)}$$

Total age of two sons = 6×2

$$\Rightarrow c + d = 12 \text{ years} \quad \text{-----(2)}$$

From equations (1) and (2), we get

$$a + b + 12 = 76$$

$$\Rightarrow a + b = 64 \quad \text{-----(3)}$$

According to the question,

$$(c + d + b)/3 = (c + d + a)/3 + 4$$

$$\Rightarrow (c + d + b) = (c + d + a) + 12$$

$$\Rightarrow b - a = 12 \quad \text{-----(4)}$$

From equations (3) and (4), we get

$$2b = 64 + 12$$

$$\Rightarrow b = 76/2$$

$$\Rightarrow b = 38 \text{ years}$$

Put, $b = 38$ in equation (3)

$$a + 38 = 64$$

$$\Rightarrow a = 26 \text{ years}$$

The ratio of the ages between the father and mother = $b : a$

$$\Rightarrow 38 : 26$$

$$\Rightarrow 19 : 13$$

$\therefore$ The ratio of the ages between the father and mother is 19 : 13.

14. Answer: c

Explanation:

Given:

The average weight of A, B, and C = 84 kg

The average weight of B, C, D and E = 79 kg.

The average weight of A, B, C and D = 80 kg

Formula used:

Average = Sum of observations / Total number of observations

Calculation:

Total weight of A, B, and C = 84×3

$$\Rightarrow A + B + C = 252 \text{ kg} \quad \text{-----(1)}$$

According to the questions,

If D joins this group, their average weight becomes 80 kg.

$$\Rightarrow A + B + C + D = 320 \text{ kg} \quad \text{-----(2)}$$

From equations (1) and (2), we get

$$A + B + C + D = 320 \text{ kg}$$

$$\Rightarrow 252 + D = 320$$

$$\Rightarrow D = 68 \text{ kg}$$

$$\text{weight of E} = 68 + 3$$

$$\Rightarrow 71 \text{ kg}$$

$$\text{Total age of B, C, D and E} = 79 \times 4$$

$$\Rightarrow B + C + D + E = 316 \text{ kg}$$

$$\Rightarrow B + C + 68 + 71 = 316$$

$$\Rightarrow B + C = 177$$

Put $(B + C) = 177$, in equation (1)

$$A + 177 = 252 \text{ kg}$$

$$\Rightarrow A = 252 - 177$$

$$\Rightarrow A = 75 \text{ kg}$$

$\therefore$ The weight of A is 75 kg.

15. Answer: c

Explanation:

Given:

Cost of two cycles = Rs. 7,800

Profit percent at first cycles = 4%

Loss percent at second cycles = 9%

Calculation:

Let the cost of the first cycle be x.

Now, the cost price of second cycle = $(7800 - x)$

According to the question,

$$x \times 104\% = (7800 - x) \times 91\%$$

$$\Rightarrow 104x/100 = (7800 - x) \times (91/100)$$

$$\Rightarrow 8x = (7800 - x) \times 7$$

$$\Rightarrow 8x = 54600 - 7x$$

$$\Rightarrow 15x = 54600$$

$$\Rightarrow x = \text{Rs. } 3640$$

The cost price of the second cycle that is sold at a loss = $(7800 - x)$

$$\Rightarrow 7800 - 3640$$

$$\Rightarrow \text{Rs. } 4,160$$

$\therefore$ The cost price of a second cycle at a loss is Rs. 4,160.

16. Answer: c

Explanation:

Given:

The selling price of an article = Rs. 144

Profit% = Cost price

Formula used:

$$\text{Profit\%} = [(SP - CP)/CP] \times 100$$

Calculation:

Let the cost price of article be Rs. x .

According to the question,

Now, profit is equal to the cost price

Profit percent = x

$$\text{Profit\%} = \left[\frac{(\text{SP} - \text{CP})}{\text{CP}} \right] \times 100$$

$$x = \left[\frac{(144 - x)}{x} \right] \times 100$$

$$\Rightarrow x^2 = 14400 - 100x$$

$$\Rightarrow x^2 + 100x - 14400 = 0$$

$$\Rightarrow x^2 + 180x - 80x - 14400 = 0$$

$$\Rightarrow x(x + 180) - 80(x + 180) = 0$$

$$\Rightarrow (x - 80)(x + 180) = 0$$

If $(x - 80) = 0$, then $x = 80$

If $(x + 180) = 0$, then $x = -180$ (Not possible)

$\therefore$ The cost price of an article is Rs. 80.

17. Answer: b

Explanation:

Given:

The cost price of a pair of shoes = Rs. 800

Marked price = Rs. 1060

Loss% = 12%

Formula used:

$$\text{Discount\%} = \left[\frac{(\text{MP} - \text{SP})}{\text{MP}} \right] \times 100$$

Calculation:

According to the question,

$$\text{Loss} = 800 \times 12\%$$

$$\Rightarrow \text{Loss} = 96$$

$$\text{SP} = \text{CP} - \text{Loss}$$

$$\Rightarrow \text{SP} = 800 - 96$$

$$\Rightarrow \text{SP} = 704$$

$$\text{Discount\%} = \left[\frac{(1060 - 704)}{1060} \right] \times 100$$

$$\Rightarrow \text{Discount\%} = \left(\frac{356}{1060} \right) \times 100$$

$$\Rightarrow \text{Discount\%} = 33.58\%$$

Which is equivalent to 33.6%

$\therefore$ The required discount percent is 33.6%.

18. Answer: a

Explanation:

Given:

Profit% of P = 25%

Loss% of Q = 15%

Profit% of R = 20%

C.P. of S = Rs, 204

Formula used:

$$S.P = C.P (1 + P\%/100)$$

$$S.P = C.P (1 - L\%/100)$$

Where, C.P. = Cost price, S.P. = Selling price

P = Profit, L = loss

Calculation:

Let the cost price for P be Rs. x

According to the question, we have

$$\text{Cost price for Q} = x \times 125\%$$

$$\Rightarrow 5x/4$$

$$\text{Cost price for R} = (5x/4) \times 85\%$$

$$\Rightarrow 17x/16$$

$$\text{Cost price for S} = (17x/16) \times 120\%$$

$$\Rightarrow 102x/80$$

And, now according to the question Cost price for S is Rs. 204

$$102x/80 = 204$$

$$\Rightarrow x = 160$$

$\therefore$ The cost price for P is Rs. 160.

19. Answer: d

Explanation:

Given:

Reduction in Marked Price = Rs. 3

Selling Price = Rs. 42

Formula used:

M.P. = S.P. + Discount

Discount% = (Discount/M.P) $\times$ 100

Calculation:

According to the formula, we have

M.P. = Rs, (42 + 3) = Rs. 45

So, Discount% = (3/45) $\times$ 100

$$\Rightarrow 20/3 = 6\frac{2}{3}$$

$\therefore$ The discount percentage is $6\frac{2}{3}$.

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20. Answer: a**Explanation:**

Given:

Discount is given on Marked Price = 20%

Profit earned = 12%

Formula used:

$$\text{S.P.} = \text{M.P.} - D\% \text{ of M.P.}$$

$$\text{C.P.} = (\text{S.P.} \times 100) / (100 + P)$$

$$\text{Mark up\%} = \{(\text{M.P.} - \text{C.P.}) / \text{C.P.}\} \times 100$$

Where, M.P. = Mark price, C.P. = Cost price, S.P. = Selling price

P = Profit%

Calculation:

Let the M.P. be 100

Then, S.P. = 100 - 20% of 100

$$\Rightarrow 100 - (20/100) \times 100 = 80$$

$$\text{Now, C.P.} = (80 \times 100) / (100 + 12)$$

$$\Rightarrow 8000 / 112 = 71.43$$

$$\text{So, Mark up\%} = \{(100 - 71.43) / 71.43\} \times 100$$

$$\Rightarrow (28.57 / 71.43) \times 100 = 39.999 \sim 40$$

$\therefore$ The mark up percent is 40.

★ Alternate Method

We know that 20% = 1/5, 12% = 3/25

$$\text{MP} : \text{SP} = 5 : 4$$

$$\text{CP} : \text{SP} = 25 : 28$$

$$\text{MP} : \text{SP} : \text{CP} = 140 : 112 : 100$$

$$\therefore \text{Required ratio} = 40/100 \times 100 = 40\%$$

21. Answer: a

Explanation:

Given:

Length of the train = 180 m

Time taken to cross the pole = 18 seconds

The new length of train = 150 m

The length of the bridge = 120 m

Formula used:

Speed = Distance/Time

Calculation:

According to the formula, we have

Speed of the train = $(180/18)$ m/s = 10 m/s

While crossing the bridge, the total distance = $(150 + 120)$ m = 270 m

So, time taken by train to cross the bridge = $(270/10)$ seconds = 27 seconds

$\therefore$ The required time is 27 seconds.

22. Answer: b**Explanation:**

Given:

A defeats B in 10 m and C in 28 m

Calculation:

In a 100 meters race A defeats B by 10 meters

So, when A covers 100 meters B covers 90 meters.

So, the ratio of distance covered by A and B = 100 : 90

Also, A defeats C in 28 meters.

So, when A covers 100 meters then C covers 72 meters.

Then, the ratio of distance covered by A and C = 100 : 72

So, the ratio of distance covered by A, B and C = 100 : 90 : 72

In 90 m B defeats C by 18 m

⇒ In 100 m B defeats C by $18 \times 100/90$

∴ B defeats C by 20 meters.

23. Answer: a

Explanation:

Given:

A certain number of men complete the work in 60 days.

When 8 men join, work completed 15 days earlier,

Means $(60 - 15) = 45$ days

Concept used:

Total work = Total Manpower × Days

$$M_1 \times D_1 = M_2 \times D_2$$

Calculation:

Let the number of men originally be N

According to the question,

$$\Rightarrow N \times 60 = (N + 8) \times 45$$

$$\Rightarrow N \times 60 = N \times 45 + 360$$

$$\Rightarrow N \times 15 = 360$$

$$\Rightarrow N = 24$$

$\therefore$ The number of men originally is '24'.

24. Answer: c

Explanation:

Given:

12 men and 16 women can do a piece of work in 6 days.

15 men and 30 women can do same piece of work in 4 days.

Concept used:

Work = Total manpower $\times$ Total days

$$M_1 D_1 \times W_1 = M_2 D_2 \times W_2$$

Calculation:

Let the efficiency of 1 man be M

And the efficiency of 1 women be W

According to the question,

$$(\text{Work})_1 = (\text{Work})_2$$

$$\Rightarrow (12M + 16W) \times 6 = (15M + 30W) \times 4$$

$$\Rightarrow 72M + 96W = 60M + 120W$$

$$\Rightarrow 12M = 24W$$

$$\Rightarrow M = 2W$$

$$12 \text{ men and } 16 \text{ woman} = 12M + 16W$$

$$\Rightarrow 12(2W) + 16W$$

$$\Rightarrow 24W + 16W$$

$$\Rightarrow 40W$$

$$6 \text{ men and } 12 \text{ women} = 6M + 12W$$

$$\Rightarrow 6(2W) + 12W$$

$$\Rightarrow 12W + 12W$$

$$\Rightarrow 24W$$

$$M_1 D_1 \backslash W_1 = M_2 D_2 \backslash W_2$$

$$\Rightarrow 40W \times 6 = 24W \times D_2$$

$$\Rightarrow D_2 = 10 \text{ days}$$

$\therefore$ The time (in days) needed for 6 men and 12 women to complete the work is 10 days

25. Answer: d

Explanation:

Given:

The ratio of time taken by Chandu and Avinash = 2:1

$\therefore$ The ratio of their efficiency = 1 : 2

The ratio of time taken by Chandu and Satish = 3:1

∴ The ratio of their efficiency = 1:3

Calculation:

By equalizing the above ratios, we find that the ratio of the time taken (in days) by Chandu, Avinash and Satish is 6 : 3 : 2

By taking LCM as 6 which represents total work to be done.

Similarly, the ratio of the efficiency of Chandu, Avinash, and Satish = 1 : 2 : 3

Total work done by Avinash and Satish in a day = (2 + 3) = 5

Chandu did work for 2 days, the remaining work will be (6 - 1 × 2) = 4

The remaining work to be done by Avinash and Satish (in hours) = $\frac{4}{5}$ days = $\frac{4}{5} \times 24$ hours

∴ The required hours = $19\frac{1}{5}$

26. Answer: a

Explanation:

Time = 9 : 40

Angle = $\theta = |(60 \times \text{hour} - 11 \times \text{minute})/2|$

And another angle = $(360 - \theta)^\circ$

∴ $\theta = |(60 \times 9 - 11 \times 40)/2|^\circ$

= $|(540 - 440)/2|^\circ$

= $(100/2)^\circ$

= 50°

And another angle = $(360 - \theta)^\circ = (360 - 50)^\circ = 310^\circ$

In the option, 50° is given.

Hence, ' 50° ' is the correct answer.

27. Answer: b

Explanation:

$$\text{Time} = 60/11 \times (\text{Firsttime} \pm 6)$$

(When Time < 6 then Addition, if Time > 6 then Subtraction)

$$\text{Time} = 60/11 \times (4 + 6)$$

$$= 600/11$$

$$= 54\frac{6}{11} \text{ minutes past 4 O' clock}$$

So approx. at 4:54 between 4 and 5 O'clock will the hands of a clock be in opposite directions.

Hence, ' $54\frac{6}{11}$ minutes past 4 O' clock' is the correct answer.

28. Answer: b

Explanation:

The logic followed is:

In an ordinary year, there are 365 days and on dividing 365 by 7, we get remainder = 1 so this extra one day is taken as an odd day.

Similarly, in a leap year, there are 366 days and on dividing 366 by 7, we get remainder = 2 so these extra days are taken as the odd days.

Thus, the remainder, which we get after dividing the number of days by 7 is considered as odd days.

1 January 1991 → Tuesday

1 January 1992 → Wednesday

1 January 1993 → Friday

1 January 1994 → Saturday

1 January 1995 → Sunday

1 January 1996 → Monday

1 January 1997 → Wednesday

1 January 1998 → Thursday

As 1 January is Thursday,

So $1 + 7 = 8^{\text{th}}$ January will also fall on Thursday

$8 + 7 = 15^{\text{th}}$ January will also fall on Thursday

$15 + 7 = 22^{\text{nd}}$ January will also fall on Thursday

Now, $22 + 4 = 26^{\text{th}}$ January

So, the day on 26^{th} January 1998 will fall on (Thursday + 4) = Monday

Hence, ' **Monday** ' is the correct answer.

★ Additional Information

Year - One year has 365 days or 366 days on this basis the year is divided into two parts:

- Normal year - It has 365 days.
- Leap year - It has 366 days and completely divisible by 4.

Century leap year – The year which is exactly divisible by 400. Example – 1200, 1600, 2000 etc.

Counting of Odd days

Ordinary Year: 365 days (52 weeks + 1 days)

= 1 Odd days

Leap Year: 366 days (52 weeks + 2 days)

= 2 Odd days

29. Answer: d

Explanation:

★ Shortcut Trick

Times (Investment × Time)	A	B
(1)	$4x \times 3 = 12x$	$5x \times 3 = 15x$
(2)	$3x \times 9 = 27x$ $= 39x$	$4x \times 9 = 36x$ $= 51x$

Ratio of A : B = $39x : 51x$

Total Profit $\Rightarrow 90x \rightarrow 9000$

$x \rightarrow 100$

Profit of B = $51x \rightarrow 51 \times 100$

= Rs. 5100

∴ B's share of profit is Rs 5,100.

Traditional Method:

Given:

Let investments of A and B be '4x' and '5x'.

Profit at the end of the year = Rs 9,000.

Formula used:

Investment × time = amount invested

Calculation:

'A' invested '4x' for 3 months = $4x \times 3$

⇒ 12x

Then, 'A' withdraws 25% of '4x'.

⇒ The remaining amount of A = '3x'

⇒ Amount invested by A for remaining 9 months = $3x \times 9$

⇒ 27x

Thus, the total amount invested by A = $12x + 27x$

⇒ 39x

'B' invested '5x' for 3 months = $5x \times 3$

⇒ 15x

Then, 'B' withdraws 20% of '5x'.

⇒ The remaining amount of B = '4x'

⇒ Amount invested by B for remaining 9 months = $4x \times 9$

$$\Rightarrow 36x$$

Thus, total amount invested by B = $15x + 36x$

$$\Rightarrow 51x$$

Total amount invested by both A and B = $39x + 51x$

$$\Rightarrow 90x$$

The total amount invested gives total profit.

$$\text{So, } 90x \rightarrow 9,000$$

$$\Rightarrow x \rightarrow 100$$

Thus, profit of B = $51x$

$$\Rightarrow x \rightarrow 5100$$

$\therefore$ B's share of profit is Rs 5,100

30. Answer: c

Explanation:

★ Shortcut Trick

Given:

Capital of A = 8 units (for 1 year)

Capital of B = 9 units (for 1 year) + $(9/3)$ units (for $9/12$ years)

Capital of C = 10 units (for 1 year) - $(10/5)$ units (for $1/2$ years)

Calculation:

$$\Rightarrow \text{Profit of A} = 8 \text{ units}$$

$$\Rightarrow \text{Profit of B} = 9 + (9/3) \times (9/12) = 45/4 \text{ units}$$

$$\Rightarrow \text{Profit of C} = 10 - (10/5) \times (1/2) = 9 \text{ units}$$

We know that **total annual profit is a multiple of 7**

$$\Rightarrow \text{Total Profit} = 113/4 \text{ units (not a multiple of 7)}$$

$\therefore$ C's share is Rs. 75,600 that is a multiple of 7.

★ Alternate Method

The profit ratio of A, B, C is given by the following table:

A	B	C
8×12	$9 \times 12 + 3 \times 9$	$10 \times 12 - 2 \times 6$
96	135	108

$$\text{Total profit} = 96 + 135 + 108 = 339 \text{ units}$$

$$\Rightarrow 339 \text{ units} \equiv \text{Rs. } 237,300$$

$$\Rightarrow 1 \text{ unit} \equiv \text{Rs. } 700$$

$$\Rightarrow 108 \text{ units} \equiv \text{Rs. } 75600$$

$\therefore$ C's share is Rs. 75600.

Traditional Method:

Given:

$$\text{Capital of A : B : C} = 8 : 9 : 10$$

$$\text{Annual Profit} = \text{Rs. } 2,37,300$$

Calculations:

$$\text{Capital of A} = 8 \text{ units}$$

Duration of A's capital = 12 months

⇒ **Total Investment amount of A = $8 \times 12 = 96$ units**

Capital of B = 9 units

Duration of B's capital = 12 months

Additional Capital of B = $(1/3) \times 9 = 3$ units

Duration of additional Capital of B = 9 months

⇒ **Total Investment amount of B = $(9 \times 12) + (3 \times 9) = 135$ units**

Capital of C = 10 units

Duration of C's capital = 12 months

Withdrawal in C's capital = $(1/5) \times 10 = 2$ units

Duration of withdrawal capital of C = 6 months

⇒ **Total Investment amount of C = $(10 \times 12) - (2 \times 6) = 108$ units**

⇒ Total investment of A + B + C = 339 units

⇒ 339 units $\equiv$ Rs. 2,37,300

⇒ 1 unit $\equiv$ Rs. 700

⇒ 108 units $\equiv$ Rs. 75,600

∴ **C's share is Rs. 75,600.**

31. Answer: d

Explanation:

★ Shortcut Trick

Comparing the powers of all the options with the form $(2x)^x$

we have $x = 5/2$

$\therefore (2x)^x$ is equal to $5^{5/2}$.

★ Alternate Method

Given:

$$4^x - 4^{(x-1)} = 24$$

Calculation:

$$4^x - 4^{(x-1)} = 24$$

$$\Rightarrow 2^{(2x)} - 2^{(2x-2)} = 24$$

All the options have $5/2$ as their powers so, let us check it for $x = 5/2$

$$\Rightarrow 2^5 - 2^3 = 24$$

We know that

The last digit of 2^5 is 2 and the last digit of 2^3 is 8

So, the last digit of $2^5 - 2^3$ is 4 (which satisfies our given condition)

Putting value of $x = 5/2$ in $(2x)^x$

$\therefore (2x)^x$ is $(5)^{5/2}$.

Traditional Method:

Given:

$$4^x - 4^{(x-1)} = 24$$

Calculation:

$$4^x - 4^{(x-1)} = 24$$

$$\Rightarrow 2^{2x} - 2^{(2x-2)} = 24$$

$$\Rightarrow 2^{(2x-2)} (2^2 - 1) = 24$$

$$\Rightarrow 2^{(2x-2)} = 8$$

$$\Rightarrow 2^{(2x-2)} = 2^3$$

Comparing the powers we have

$$\Rightarrow 2x - 2 = 3$$

$$\Rightarrow x = 5/2$$

$$\therefore (2x)^x \text{ is } (5)^{5/2}$$

32. Answer: a

Explanation:

Given:

$$18 - [5 - 66 + 2(7 - \overline{8 - 5})]$$

Concept Used:

B	Brackets in order {}, {}, []	ब्रैकेट {}, {}, [] क्रम में
O	of	का
D	Division (÷)	विभाजन (÷)
M	Multiplication (×)	गुणा (×)
A	Addition (+)	जोड़ (+)
S	Subtraction (-)	घटाव (-)

Calculation:

$$18 - [5 - 66 + 2(7 - 3)]$$

$$\Rightarrow 18 - [5 - 66 + 8]$$

$$\Rightarrow 18 - [-53]$$

$$\Rightarrow 71$$

$\therefore$ The required number is 71.

33. Answer: d

Explanation:

Given that:

$$55.005 + 0.0155 + 5055.05555 + 50.150 - 59.91319 - 5100.31286 = ?$$

★ Shortcut Trick

Considering the whole numbers only,

$$(55 + 0 + 5055 + 50) - (59 + 5100)$$

$$\Rightarrow 5160 - 5159 = 1 \approx 0$$

All other options are far bigger than 0

$\therefore$ The required value is 0

★ Alternate Method

Calculation:

$$(55.005 + 0.0155 + 5055.05555 + 50.150) - (59.91319 + 5100.31286)$$

$$\Rightarrow 5160.22605 - 5160.22605 = 0$$

$\therefore$ The required value is 0

34. Answer: b

Explanation:

Given:

$$\text{L.C.M} = 30$$

Concept:

$$\text{L.C.M} = a^p \times b^q \times c^r$$

Where a, b, c are prime numbers

And p, q, r are the power of prime numbers respectively.

Formula:

$$\text{Number of ordered pairs} = (2p + 1)(2q + 1)(2r + 1)$$

Calculation:

$$\text{L.C.M} = 2^1 \times 3^1 \times 5^1$$

$$\text{Here } p = 1, q = 1, r = 1$$

Put the value of p, q, r in the above formula.

$$\text{Number of ordered pairs} = (2 \times 1 + 1)(2 \times 1 + 1)(2 \times 1 + 1)$$

$$\Rightarrow 3 \times 3 \times 3$$

$$\Rightarrow 27$$

$\therefore$ Number of ordered pairs of positive integers are '27'.

★ Additional Information

$$\text{Number of unordered pairs} = [(2p + 1)(2q + 1)(2r + 1) + 1] \div 2.$$

35. Answer: c

Explanation:

LCM of 6, 9, 15, 18 is 90.

Let the number is $(90k+4)$, which is multiple of 7.

Put the value of $k=1, 2, 3, 4, 5, \dots$

Put $k = 1$

$$\Rightarrow (90 \times 1 + 4) = 94$$

$$\Rightarrow 94 \div 7, \text{ remainder} = 3$$

Put $k = 2$

$$\Rightarrow (90 \times 2 + 4) = 184$$

$$\Rightarrow 184 \div 7, \text{ remainder} = 2$$

Put $k = 3$

$$\Rightarrow (90 \times 3 + 4) = 274$$

$$\Rightarrow 274 \div 7, \text{ remainder} = 1$$

Put $k = 4$

$$\Rightarrow (90 \times 4 + 4) = 364$$

$$\Rightarrow 364 \div 7, \text{ remainder} = 0$$

$\therefore 364$ is the least multiple of 7 which leaves 4 as remainder when divided by each of 6, 9, 15 and 18.

36. Answer: b

Explanation:

Given:

$$\text{H.C.F.} = 33$$

Calculation:

Let the two numbers be $33a$ and $33b$ ($\because 33$ is the H.C.F.)

$$33a + 33b = 594$$

$$\Rightarrow 33(a + b) = 594$$

$$\Rightarrow a + b = 594/33$$

$$\Rightarrow a + b = 18$$

Now, a and b must be co-primes

Pairs = (1, 17), (5, 13), and (7, 11)

$\therefore$ Number of pairs are '3'.

37. Answer: d

Explanation:

Concept:

Integer = It is a whole number (not a fractional number) that can be positive, negative, or zero. Examples of integers are: -8, 0, 1, 8, 23, and -3,043 etc.

Rational Number = It is a type of real number, which is in the form of p/q where q is not equal to zero. Any fraction with non-zero denominators is a rational number. Examples of rational numbers are $2/3$, $0/1$, $5/4$, and $22/45$, etc.

Calculation:

$$1 + 2 + 3 + \dots + 18 = \frac{18 \times (1 + 18)}{2} = 171$$

$$\frac{4}{3k}, \frac{20}{42k}, \frac{8}{6k} \text{ and } \frac{36}{63k} \text{ ----(1)}$$

According to the option,

Option 4

$k = 4/42$ put in the equation (1), then we get

$\Rightarrow 14, 5, 14, \text{ and } 6$

Option 1

$k = 4/126$ put in the equation (1), then we get also an integer.

But Question asks the greatest value of k , then $k = 4/42$ is the correct answer.

$\therefore$ The greatest value of k is $4/42$.

38. Answer: c

Explanation:

Given:-

$AB = 30$ units, $CD = 10$ units, $BC = 40$ units

Concept Used:-

Pythagoras Theorem

$$P^2 + B^2 = H^2$$

Where (P = Perpendicular, B = Base, H = Hypotonous)

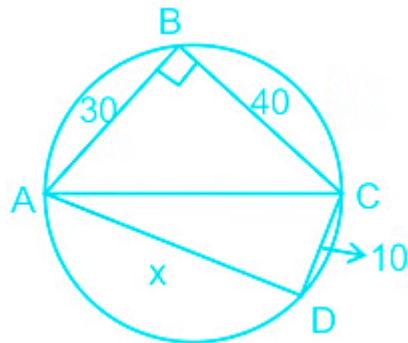
Angle made by the Diametre on the Circumference is always 90° .

Area of right angle Triangle

$$(B \times P)/2$$

Where (P = Perpendicular, B = Base)

Calculation:-



In Quadrilateral ABCD, let AD be x

According to the question, we have ,

$$30^2 + 40^2 = 10^2 + x^2$$

$$\Rightarrow x^2 = 30^2 + 40^2 - 10^2$$

$$\Rightarrow x^2 = 900 + 1600 - 100$$

$$\Rightarrow x^2 = 2400$$

$$\Rightarrow x = 20\sqrt{6}$$

The Length of AD in Quadrilateral ABCD is $20\sqrt{6}$

Area of Quadrilateral ABCD = Area of ΔABC + Area of ΔADC

$$\Rightarrow \{(AB \times BC)/2\} + \{(AD \times DC)/2\}$$

$$\Rightarrow \{(30 \times 40)/2\} + \{(20\sqrt{6} \times 10)/2\}$$

$$\Rightarrow 600 + 100\sqrt{6}$$

$$\Rightarrow 100(6 + \sqrt{6})$$

$\therefore 100(6 + \sqrt{6})$ is the area of Quadrilateral ABCD.

39. Answer: d

Explanation:

Given :-

$$\text{Area} = 462 \text{ cm}^2$$

Formula Used :-

$$\text{Area of a Circle} = \pi r^2$$

$$\text{Height of Equilateral Triangle} = (\sqrt{3}/2)a \quad (a = \text{Side of Equilateral})$$

$$\text{Perimeter of Equilateral Triangle} = 3a$$

Calculation:-

According to the question,

$$\pi r^2 = 462$$

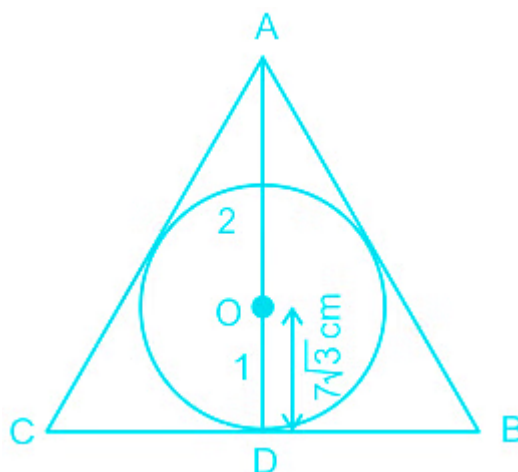
$$\Rightarrow (22/7) \times r^2 = 462$$

$$\Rightarrow r^2 = (462 \times 7)/22$$

$$\Rightarrow r^2 = 147$$

$$\Rightarrow r = 7\sqrt{3}$$

So, Radius of Circle is $7\sqrt{3}$ cm



Here, we get

$$1 \text{ unit} \rightarrow 7\sqrt{3} \text{ cm}$$

$$3 \text{ unit} \rightarrow 3 \times 7\sqrt{3} \text{ cm}$$

$$3 \text{ unit} \rightarrow 21\sqrt{3} \text{ cm}$$

So, the length of AD is $21\sqrt{3} \text{ cm}$.

We get,

$$AD(\text{Height of } \triangle ABC) = 21\sqrt{3} \text{ cm.}$$

$$\left(\frac{\sqrt{3}}{2}\right)a = 21\sqrt{3}$$

$$\Rightarrow a = 42$$

So, Side of Equilateral(a) $\triangle ABC$ is 42 cm.

$$\text{Perimeter of Equilateral } \triangle ABC = 3 \times a$$

$$\Rightarrow 3 \times 42$$

$$\Rightarrow 126$$

$\therefore$ Perimeter of Equilateral $\triangle ABC$ is 126 cm.

★ Important Points

The Centroid is a point on the median of an Equilateral Triangle that divides the median in **2 : 1**.

40. Answer: d

Explanation:

Given:

Ratio of length, breadth & height = 3 : 2 : 1

Sum of their dimensions = 18 m

Rate of painting per sq. meter = Rs. 15

Formula Used:

Total area of the walls and the ceiling = $\{2(l + b)h\} + (l \times b)$

Where l = length, b = breadth, & h = height

Total expenditure of painting = total area of the walls & the ceiling $\times$ Rate of painting

Calculation:

Let length = $3x$, breadth = $2x$, & height = x

Now, sum of dimensions = $3x + 2x + x = 6x$

Since, sum of dimensions = 18m

So, $6x = 18$ m

$\Rightarrow x = 3$ m

Then length = 9m, breadth = 6m & height = 3 m

Now, according to formula used

Total area of the walls & the ceiling = $\{2 \times (9 + 6) \times 3\} + (9 \times 6)$

$$\Rightarrow (2 \times 15 \times 3) + 54$$

$$\Rightarrow 90 + 54 = 144 \text{ m}^2$$

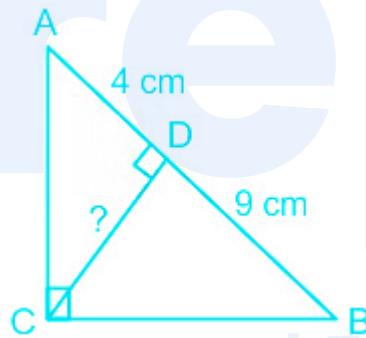
Now, total expenditure of painting = 144×15

$$\Rightarrow 2160$$

$\therefore$ The expenditure involved is Rs. 2160

41. Answer: a

Explanation:



★ Shortcut Trick

Since this type of question is specific case in right-angled triangle.

So, we use can use the following formula directly.

$$\Rightarrow CD^2 = AD \times BD$$

$$\Rightarrow CD^2 = 4 \text{ cm} \times 9 \text{ cm}$$

$$\Rightarrow CD^2 = 36 \text{ cm}^2$$

$$\Rightarrow CD = 6 \text{ cm}$$

$\therefore$ Length of CD is 6 cm

Traditional Method

Given:

$$\angle ACB = 90^\circ, AD = 4 \text{ cm, \& } BD = 9 \text{ cm}$$

Also CD is perpendicular to AB

Calculation:

Since, $\triangle ADC$ & $\triangle BDC$ are Right angled triangles

$$\text{So, } \triangle ADC \sim \triangle BDC$$

$$\Rightarrow (CD/BD) = (AD/CD)$$

$$\Rightarrow CD^2 = AD \times BD$$

$$\Rightarrow CD^2 = 4 \text{ cm} \times 9 \text{ cm}$$

$$\Rightarrow CD^2 = 36 \text{ cm}^2$$

$$\Rightarrow CD = 6 \text{ cm}$$

$\therefore$ Length of CD is 6 cm

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42. Answer: d

Explanation:

Given:

Diameter of cylinder = 6 cm, radius of cylinder = 3 cm

Diameter of sphere = 3 cm, radius of sphere = $3/2$ cm

Concept used:

Volume of cylinder = volume of sphere

$$\pi r^2 h = \frac{4}{3} \pi r^3$$

Calculation:

Let, the height of the cylinder will be raised by h cm

According to the question

$$\pi \times 3^2 \times h = \left(\frac{4}{3}\right) \times \pi \times \left(\frac{3}{2}\right)^3$$

$$\Rightarrow \pi \times 9 \times h = \left(\frac{4}{3}\right) \times \pi \times \left(\frac{27}{8}\right)$$

$$\Rightarrow 9 \times h = \frac{9}{2}$$

$$\Rightarrow h = \frac{1}{2} \text{ cm}$$

$\therefore$ The height of water in the cylinder will raise by $\frac{1}{2}$ cm.

43. Answer: c

Explanation:

★ Shortcut Trick

Sum of digit = if the sum of digits of any number is 9, it means that number is multiple of 9 definitely

$$\text{Volume of hollow cylinder} = \pi h (R^2 - r^2)$$

Given:

$$h = 63 \text{ (having 9 in it)}$$

Calculation:

$$\text{Volume} = \pi \times 9 (R^2 - r^2)$$

The above equation showing there is 9 in multiplication, then there will be 9 in solution definitely

There is only one option which contains 9 in it.

$$\Rightarrow 107712 = 1 + 0 + 7 + 7 + 1 + 2$$

$$\Rightarrow 18 = 1 + 8$$

$$\Rightarrow 9$$

$\therefore$ The volume of metal is 107712 cm^3

Alternate Method

Given:

Length of roller (h) = 63 cm

Circumference of roller ($2\pi R$) = 440 cm

Thickness of roller (d) = 4 cm

Formula used:

Volume of hollow cylinder = $\pi h(R^2 - r^2)$

Where, R = external radius

r = internal radius

h = height of roller

Calculation:

According to the question

$$2\pi R = 440$$

$$\Rightarrow R = 70 \text{ cm}$$

$$\Rightarrow r = R - d = 70 - 4$$

$$\Rightarrow r = 66 \text{ cm}$$

$$\text{Volume of cylinder} = \pi h(R^2 - r^2)$$

$$V = (22/7) \times 63 \times (70^2 - 66^2)$$

$$\Rightarrow V = 22 \times 9 \times (4900 - 4356)$$

$$\Rightarrow V = 22 \times 9 \times 544$$

$$\Rightarrow V = 107712 \text{ cm}^3$$

$\therefore$ The volume of hollow iron roller is 107712 cm^3

44. Answer: a

Explanation:

Given:

The height of the solid cone = 9 cm

The base diameter of the solid cone = 18 cm

The radius of the solid sphere = 9 cm

Formula Used:

The volume of the cone = $(1/3)\pi r^2 h$, Where, r = Radius and h = Height

The volume of the sphere = $(4/3)\pi R^3$, Where, R = Radius

The percentage of wood that is wasted = $(\text{The remaining volume of the sphere} / \text{The total volume of the sphere}) \times 100$

Calculation:

According to the given question,

$$\text{The volume of the cone} = (1/3)\pi \times 9^2 \times 9$$

$$\Rightarrow (1/3) \times (22/7) \times 81 \times 9$$

$$\Rightarrow 5346/7 \text{ cm}^3 \quad \text{-----(1)}$$

$$\text{The volume of the sphere} = (4/3)\pi \times 9^3$$

$$\Rightarrow (4/3) \times (22/7) \times 729$$

$$\Rightarrow 21384/7 \text{ cm}^3 \quad \text{-----(2)}$$

By subtracting the equation (2) from equation (1) we get,

$$\text{The remaining volume of the sphere (the amount of wood wasted)} = (21384/7) - (5346/7) = 16038/7 \text{ cm}^3$$

$$\text{The percentage of wood that is wasted} = (16038/7)/(21384/7) \times 100 = 75\%$$

$\therefore$ The percentage of wood that is wasted is 75%.

45. Answer: b

Explanation:

★ Shortcut Trick

Let the total capacity of the tank is 100%.

The efficiency of the first pipe to fill the tank is $100/20 = 5\%$ per hour

The efficiency of the second pipe to fill the tank is $100/30 = 3.33\%$ per hour

The combined efficiency of both the pipes = $5\% + 3.33\% = 8.33\%$

Time taken by both the pipes to fill the one-third of the tank = $33.33/8.33 = 4$ hours

Time taken by both the pipes to fill the whole tank = $100/8.33 = 12$ hours

So, the total time (in hours) taken to fill the tank = 4 hours + 12 hours = 16 hours

$\therefore$ The total time (in hours) taken to fill the tank is 16 hours.

★ Alternate Method

Given:

Two pipes fill a tank in 20 hours and 30 hours respectively.

Formula Used:

The efficiency of a pipe to fill a tank = Total capacity of a tank/Time taken by a pipe to fill a tank

Calculation:

Let the capacity of the tank is 60 units (LCM of 20 and 30).

The efficiency of the first pipe is $60/20 = 3$

The efficiency of the second pipe is $60/30 = 2$

The combined efficiency of both the pipes is $3 + 2 = 5$.

The one-third capacity of the tank is $(1/3) \times 60 = 20$

The time taken by both the pipes to fill the one-third of the tank = $20/5 = 4$ hours

Now, the tank is empty and it needs to be filled again by both the pipes.

So, the time taken by both the pipes to fill the whole tank = $60/5 = 12$ hours

The total time (in hours) taken to fill the tank = 4 hours + 12 hours = 16 hours

∴ The total time (in hours) taken to fill the tank is 16 hours.

46. Answer: c

Explanation:

 **Shortcut Trick**

	A	B	C	A + B	A + B + C
Time (min)	12	15	6	5	45
Efficiency	5	4	-10	9	-1
Work / cirstern	60			45	45

∴ The further time required to empty the cistern is 45 minutes.

Traditional Method:

Given:

Let three pipes be A, B, and C.

A and B are inlet pipes while C is an outlet pipe.

And the time is taken by A, B, and C.

Formula used:

Time × efficiency = work

Calculation:

Time is taken by A to fill the cistern = 12 minutes

Time is taken by B to fill the cistern = 15 minutes

Time is taken by C to empty the cistern = 6 minutes

L.C.M. of (12, 15, and 6) = 60

L.C.M is defining the work actually.

Thus, the efficiency of A = $60/12 = 5$

⇒ The efficiency of B = $60/15 = 4$

⇒ The efficiency of C = $60/6 = 10$

(∵ efficiency of C will be negative as it is an outlet pipe)

A and B opened for the first 5 minutes

Efficiency of A + B = 9

Work done by A and B together = 5×9

⇒ 45

Efficiency of A + B + C = -1

Time is taken to empty the tank = $45/1$

⇒ 45 minutes

∴ The further time required to empty the cistern is 45 minutes.



Personal Exams Guide
Important Point

The efficiency of the outlet pipe is always 'negative'.

47. Answer: a

Explanation:

Given:

Income = Rs. 40,000

Increase in income = 8%

Increase in expenditure = 12%

Decrease in savings = 4%

Let the expenditure and savings be $100x$ and $100y$ respectively.

Formula Used : Income = expenditure + savings

ATQ, $100x + 100y = 40,000$

$$\Rightarrow 100(x + y) = 40,000$$

$$\Rightarrow x + y = 400 \quad \text{-----(1)}$$

$$100x \times (112/100) + 100y \times (96/100) = 40,000 \times (108/100)$$

$$\Rightarrow 112x + 96y = 43200 \quad \text{-----(2)}$$

From equation (1),

$$x + y = 400$$

$$\Rightarrow x = 400 - y$$

Now putting this value of x in equation (2), we get

$$112(400 - y) + 96y = 43200$$

$$\Rightarrow 44800 - 112y + 96y = 43200$$

$$\Rightarrow 16y = 1600$$

$$\Rightarrow y = 100$$

$$\therefore \text{Initial saving} = 100y = 100 \times 100 = 10,000$$

$\therefore$ The initial saving is **Rs. 10,000**

48. Answer: b

Explanation:

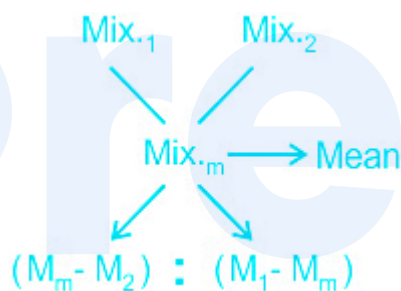
Alternate Method

Given:

In-vessel A the quantity of milk = $\frac{4}{7}$

In vessel A the quantity of milk = $\frac{2}{5}$

Concept Used:



Calculation:

According to Question

In-vessel C the quantity of milk = $\frac{1}{2}$

$$\begin{array}{ccc}
 \frac{4}{7} & & \frac{2}{5} \\
 & \searrow \quad \swarrow & \\
 & \frac{1}{2} & \\
 & \swarrow \quad \searrow & \\
 \left(\frac{1}{2} - \frac{2}{5}\right) & : & \left(\frac{4}{7} - \frac{1}{2}\right) \\
 \frac{1}{10} & : & \frac{1}{14}
 \end{array}$$

∴ The required ratio taken from Vessel A & B is 14 : 10 or 7 : 5

Traditional Method:

Given:

In-vessel A the quantity of milk = $(\frac{4}{7})X$

In-vessel B the quantity of milk = $(\frac{2}{5})Y$

Concept Used :

Initial Quantity = Final Quantity

Calculation:

According to question

$$\Rightarrow (\frac{4}{7})X + (\frac{2}{5})Y = (\frac{1}{2}) \times (X + Y)$$

$$\Rightarrow X : Y = 7 : 5$$

∴ The required ratio taken from Vessel A & B is 14 : 10 or 7 : 5

49. Answer: d

Explanation:

 Alternate Method

Here the average marks of 120 candidates are 35

The average marks of passed candidates are 39

The average marks of failed candidates are 15

Concept Used :

Input = Output

Calculation:

According to the question,

$$(39 - 35)K = (35 - 15)L$$

Here K is used for passed students & L is used for failed students

$$\Rightarrow 4K = 20L$$

$$\Rightarrow K : L = 5 : 1$$

Let K be $5x$ and L be x

According to the question,

$$5x + x = 120$$

$$\Rightarrow (5 + 1)x = 120$$

$$\Rightarrow 6x = 120$$

$$\Rightarrow x = 20$$

Now, number of passed students = $5x$

$$\Rightarrow 5 \times 20 = 100$$

$\therefore$ The number of Passing students are 100

Traditional Method:**Given:**

Here the average marks of 120 candidates are 35

The average marks of passed candidates are 39

The average marks of failed candidates are 15

Concept Used :

Total number of all the students = Number of pass students + Number of fail students

Calculation:

Let the total number of passed students be X

Let the total number of failed students be Y

According to Question,

$$35(X + Y) = 39(X) + 15(Y)$$

$$\Rightarrow 20(Y) = 4(X)$$

$$\Rightarrow X : Y = 5 : 1$$

$$\Rightarrow (5 + 1) \text{ Unit} = 120$$

$$\Rightarrow 1 \text{ Unit} = 20$$

$$\Rightarrow \text{Passed student is } 5 \times 20 = 100$$

$\therefore$ The number of passed students is 100

50. **Answer: d**

Explanation:

Given:

Sum of 5 consecutive odd numbers = 195

Formula used:

Middle term of odd term series = sum of the numbers / total terms

Percentage = (given value / total value) $\times$ 100

Calculation:

Middle term of consecutive odd number series = $195/5$

⇒ 39

So the other term will be 35, 37, 39, 41, 43

The second-lowest number of this series = 37

Second highest number of consecutive even number series = $37 + 5$

⇒ 42

42 will be the second-highest term of another 5 consecutive even number series.

so the other term will be 36, 38, 40, 42 and 44

65% of middle term = $(65 \times 40) / 100$

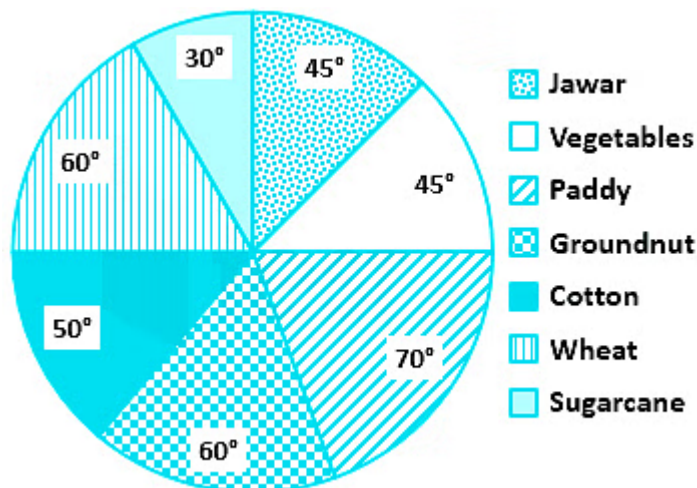
⇒ $2600 / 100$

⇒ 26

∴ 65% of the middle number of series of consecutive even numbers will be 26.

51. Answer: d

Explanation:



Given:

Central angle for Jawar = 45°

Central angle for Vegetables = 45°

Concept used:

The total angle subtended on the circle be 360° .

Calculation:

According to the question

The angle subtended by jawar and vegetables both = 90°

The total angle subtended on the circle be 360° .

The percentage of the area allocated to Jowar and Vegetables put together =
 $(90/360) \times 100\%$

$$\Rightarrow 100/4 = 25\%$$

$\therefore$ The percentage of the area allocated to Jowar and Vegetables put together will be 25%.

52. Answer: b

Explanation:

Given:

Land allocated for Paddy = 70° and,

Land allocated for Vegetables = 45°

Calculation:

Let the total land be L.

Then, Land allocated for Paddy = $(70^\circ/360^\circ) \times L$

Land allocated for Vegetables = $(45^\circ/360^\circ) \times L$

$\therefore$ The ratio of land allocated for Paddy to Vegetables = $\frac{(70^\circ/360^\circ) \times L}{(45^\circ/360^\circ) \times L} = 14/9$

★ Shortcut Trick

Ratio of land allocated for Paddy to Vegetables = $(70^\circ/45^\circ) = (14/9)$.

53. Answer: a

Explanation:

★ Shortcut Trick

$$(a/b) = (50^\circ/60^\circ) = (5/6) = k$$

$$\therefore 6k = 6 \times (5/6) = 5$$

★ Alternate Method

Given:

Land allocated for cotton = a hectares = 50°

Land allocated for groundnut = b hectares = 60° and,

$$(a/b) = k$$

Calculation:

Let the total land allocated to food crops be L hectares.

Then, Land allocated for cotton = $(50^\circ/360^\circ) \times L = a$

and, Land allocated for groundnut = $(60^\circ/360^\circ) \times L = b$

As, $(a/b) = k$

$$\Rightarrow \frac{(50^\circ/360^\circ) \times L}{(60^\circ/360^\circ) \times L} = k$$

$$\Rightarrow (5/6) = k$$

$$\text{Now, } 6k = 6 \times (5/6) = 5$$

$\therefore$ The value of $6k$ is 5.

54. Answer: d

Explanation:

Given:

Land allocated to Vegetable crops = 120 acres

Concept:

Land allocated to vegetable = $(\text{Degree of vegetable}/360^\circ) \times \text{Total Land}$

Calculation:

Let the total land of food crops be x

and the land of wheat crops be y

$$\Rightarrow 120 = (45^\circ/360^\circ) \times \text{Total Land}$$

$$\Rightarrow x = (120 \times 360)/45$$

$$\Rightarrow x = 43200/45$$

$$\Rightarrow x = 960$$

$\Rightarrow$ The total Land of food crops is 960 acres

Now, we have to find the land of wheat crops

Again we have to use this concept

Land allocated to wheat = $(\text{Degree of wheat}/360^\circ) \times \text{Total Land}$

$$\Rightarrow y = (60^\circ/360^\circ) \times 960$$

$$\Rightarrow y = (1/6) \times 960$$

$$\Rightarrow y = (1 \times 960)/6$$

$$\Rightarrow y = 160$$

$\therefore$ The land allocated to wheat crops is 160 acres.

55. Answer: a

Explanation:

★ Shortcut Trick

Difference between the degree of Cotton and Jowar food crops = 5°

$$\Rightarrow 5^\circ = 200$$

$$\Rightarrow 1^\circ = 40$$

$$\Rightarrow \text{the land allocated for Paddy crops is } (70^\circ) = 40 \times 70$$

$\therefore$ The land allocated for paddy crops is 2800 hectare.

Traditional Method:

Given:

Degree of Jowar crops = 45°

Degree of Cotton crops = 50°

Degree of Paddy crops = 70°

Concept:

Difference between the land allocated for cotton crops and Jowar crops = (degree of Paddy crops/360°) × total Land

Calculation:

Let total land allocated for crops be x

$$\Rightarrow \text{Land allocated for cotton crops} = (50x)/360$$

$$\Rightarrow \text{Land allocated for Jowar crops} = (45x)/360$$

$$\Rightarrow \text{Land allocated for Paddy crops} = (70x)/360$$

According to the Question,

The land allocated for Cotton is 200 hectares more than the land allocated for Jowar

$$\Rightarrow [(50x)/360] - [(45x)/360] = 200$$

$$\Rightarrow (5/360)x = 200$$

$$\Rightarrow x = (200 \times 360)/5$$

$$\Rightarrow x = 72000/5 = 14400 \text{ hectares}$$

$$\Rightarrow \text{Land allocated for Paddy crops} = (70^\circ/360) \times 144000$$

$$\Rightarrow 28000$$

$\therefore$ Land allocated for Paddy crops is 28000 hectares.

56. Answer: b

Explanation:

Persons: A, B, C, D, E

(i) B and C are bright in Mathematics and Geography

(ii) A and C are bright in Mathematics and History

(iii) B and D are bright in Politics and Geography

(iv) D and E are bright in Politics and Botany

(v) E is bright in Botany, History and Politics

Subject	Mathematics	Geography	Politics	Botany	History
Students	B, C, A	B, C, D	B, D, E	D, E	A, C, E

B is bright in Politics, Mathematics and Geography.

Hence, ' B ' is the correct answer.

57. Answer: c

Explanation:

Persons: A, B, C, D, E

(i) B and C are bright in Mathematics and Geography

(ii) A and C are bright in Mathematics and History

(iii) B and D are bright in Politics and Geography

(iv) D and E are bright in Politics and Botany

(v) E is bright in Botany, History and Politics

Subject	Mathematics	Geography	Politics	Botany	History
Students	B, C, A	B, C, D	B, D, E	D, E	A, C, E

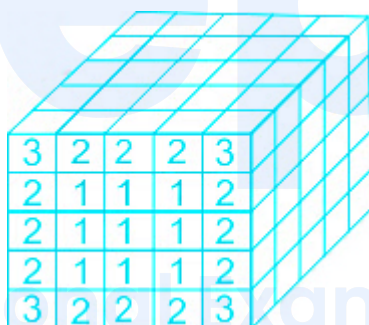
A is bright in Mathematics and History but not in Geography.

Hence, 'A' is the correct answer.

58. Answer: d

Explanation:

One side of the cube is shown below, with two exactly two sides painted.



So, we see a total of 12 faces will have exactly two sides painted.

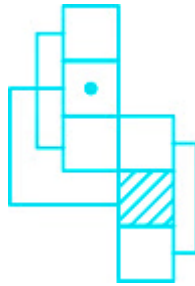
Therefore, the total number of cubes with exactly two faces painted = $3 \times 12 = 36$

Hence, '36' is the correct answer.

59. Answer: b

Explanation:

The cube when folded, the faces that will be opposite to each other is shown below:



1.



→ Cannot be formed as two opposite faces cannot appear on the same dice.

2.



→ Can be formed.

3.



→ Cannot be formed as two opposite faces cannot appear on the same dice.

4.



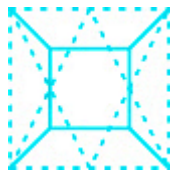
→ Cannot be formed as two opposite faces cannot appear on the same dice.

Hence, ' **option 2** ' is the correct answer.

60. Answer: c

Explanation:

One of the hidden figure, in the following figure is shown below:

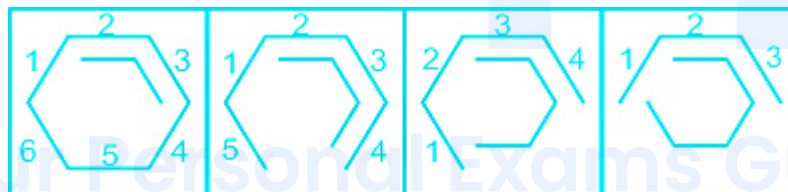


Hence, ' option 3 ' is the correct answer.

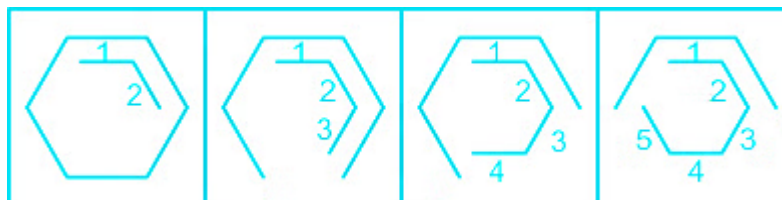
61. Answer: a

Explanation:

The closed figure inside the first cell goes on losing its sides one at a time



and the open figure inside the first cell goes on gaining its sides one at a time



Hence, ' option 1 ' is the correct answer.

62. Answer: b

Explanation:

Calculation:

$$AXB = A^2 - B^2$$

$$AYB = A^2 + B^2$$

$$(9X6) = 9^2 - 6^2 = 81 - 36 = 45$$

$$(8X5) = 8^2 - 5^2 = 64 - 25 = 39$$

$$(9X6) Y (8X5) = 45^2 + 39^2 = 2025 + 1521 = 3546$$

$$\therefore (9X6) Y (8X5) = 3546$$

63. Answer: d

Explanation:

Arrangement Pattern: Consonant Number Symbol

R * T J L 2 \$ D = M # 8 C % B < K 1 & A W ? P E + Q @ 7 F 6

Clearly, there are 2 numbers in the sequence, each of which is immediately preceded by a consonant and immediately followed by a symbol.

Two such numbers are: L 2 \$, K 1 &

Hence, '2' is the correct answer.

64. Answer: b

Explanation:

The pattern of Arrangement: Consonant Consonant Symbol

N 8 J * 4W M1U % K 2 #B D7Q I T 3 Δ P A D 5 E R

Clearly, two such consonants are there in the following sequence, each of which is immediately preceded by a consonant but not immediately followed by a symbol.

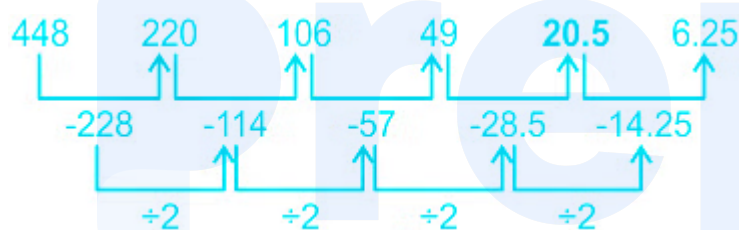
The two such arrangements are: W M 1, B D 7

Hence, ' 2 ' is the correct answer.

65. Answer: b

Explanation:

The logic is:



Hence, ' 20.5 ' is the correct answer.

66. Answer: a

Explanation:

The logic is:

$$7 + 12^2 = 7 + 144 = 151$$

$$151 + 10^2 = 151 + 100 = 251$$

$$251 + 8^2 = 251 + 64 = 315$$

$$315 + 6^2 = 315 + 36 = 351$$

Hence, ' 351 ' is the correct answer.

67. Answer: d

Explanation:

The logic is:



After dividing the series into three equal parts, we see a common pattern is observed as shown above.

Hence, ' 122 ' is the correct answer.

68. Answer: c

Explanation:

The pattern followed here is:

Alphabets	A	B	C	D	E	F	G	H	I	J	K	L	M
Positional value	1	2	3	4	5	6	7	8	9	10	11	12	13
Positional value	26	25	24	23	22	21	20	19	18	17	16	15	14
Alphabets	Z	Y	X	W	V	U	T	S	R	Q	P	O	N

According to the alphabetical positions of the letters,

A (B) CD (EF) GHI (JKL) MNOP (QRST) UVWXY

Hence, ' **MNOP** ' is the correct answer.

69. Answer: d

Explanation:

The pattern followed here is:

Alphabets	A	B	C	D	E	F	G	H	I	J	K	L	M
Positional value	1	2	3	4	5	6	7	8	9	10	11	12	13
Positional value	26	25	24	23	22	21	20	19	18	17	16	15	14
Alphabets	Z	Y	X	W	V	U	T	S	R	Q	P	O	N

According to the alphabetical positions of the letters,

$U \xrightarrow{-4} Q \xrightarrow{-4} M \xrightarrow{-4} I \xrightarrow{-4} E$
 $S \xrightarrow{-4} O \xrightarrow{-4} K \xrightarrow{-4} G \xrightarrow{-4} C$
 $R \xrightarrow{-4} N \xrightarrow{-4} J \xrightarrow{-4} F \xrightarrow{-4} B$

Hence, 'IGF' is the correct answer.

70. Answer: c

Explanation:

The logic is:

Number : Number³ - 1

5 : 124 → 5 : 5³ - 1

⇒ 5³ - 1 = 125 - 1 = 124

Similarly,

6 : ____ → 6 : 6³ - 1

$$\Rightarrow 6^3 - 1 = 216 - 1 = 215$$

Hence, ' **215** ' is the correct answer.

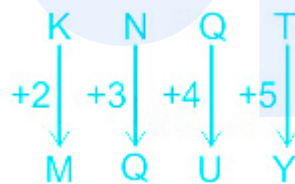
71. Answer: d

Explanation:

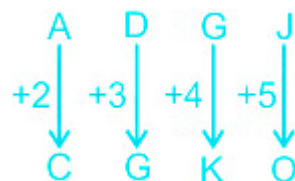
The pattern followed here is:

Alphabets	A	B	C	D	E	F	G	H	I	J	K	L	M
Positional value	1	2	3	4	5	6	7	8	9	10	11	12	13
Positional value	26	25	24	23	22	21	20	19	18	17	16	15	14
Alphabets	Z	Y	X	W	V	U	T	S	R	Q	P	O	N

According to the alphabetical positions of the letters,



Similarly,



Hence, ' **CGKO** ' is the correct answer.

72. Answer: c

Explanation:

The logic is:

Option		Description
1.	Cat : Tiger	Cat belongs to the species Tiger.
2.	Warmth : Frost	Warmth means hotness and frost means freezing. Both the words are antonyms of each other.
3.	Stout : Lusty	Stout means brave and bold and lusty means full of strength. Both the words stout and lusty are synonyms of each other.
4.	Rich : Prince	Prince are rich.

Ample : Enormous → Ample means more than adequate in size and enormous means very large in size. Both the words ample and enormous are synonyms of each other.

Similarly,

Stout: Lusty → Both the words stout and lusty are synonyms of each other.

Hence, ' **Stout: Lusty** ' is the correct answer.

73. Answer: b

Explanation:

Statement I

Given: $a > b$

Question: Is $|a| > |b|$?

At $a = 0, b = -1, |a| > |b| = 0 > 1$, the answer is No

At $a = 3, b = 1, |a| > |b| = 3 > 1$, the answer is YES

There are two different answer, hence statement I is not sufficient.

Statement II

Given: $a = b$

Question: Is $|a| > |b|$?

At any equal values of a and b , the answer will be No

$\therefore$ Statement II alone can give the answer to the question.

74. Answer: a

Explanation:

Statement I

n is divisible by $1 \times 2 \times 3 \times 4 \times 5 = 120$

n is divisible by $5 \times 6 \times 7 \times 8 \times 9 = 15120$

n is divisible by $45 \times 46 \times 47 \times 48 \times 49 = 228826080$

Statement II

n is not exactly divisible by 120 when it is the LCM of 6 and 20 that is 60

n is exactly divisible by 120 when it is the multiple of 6 and 20 that is 120

$\therefore$ Statement I alone can give the answer to the question

75. Answer: c

Explanation:

Statement I

D, E and F are mid-points of the sides of ΔABC

By this, we can deduce that ΔABC is equally divided into 4 parts

Statement II

Area of ΔABC is 10 sq. units

By taking both statement I and II

ΔABC is divided into 4 equal parts and it has the area equal to 10 sq. units

So, the area of ΔDEF will be $\frac{1}{4}$ th of the area of ΔABC

Area of ΔDEF = area of $\Delta ABC \times \frac{1}{4} = \frac{10}{4} = 2.5$ sq. units.

$\therefore$ Statment I and II together only can give the answer to this question

Your Personal Exams Guide

76. Answer: a

Explanation:

Given:

$$a_0 = 5$$

Statement I

$$a_0 = 5$$

$$a_1 = 3.a_{1-1} = 3.a_0 = 3 \times 5 = 15$$

$$a_2 = 3.a_{2-1} = 3.a_1 = 3 \times 15 = 45$$

$$a_3 = 3.a_{3-1} = 3.a_2 = 3 \times 45 = 135$$

$$a_4 = 3.a_{4-1} = 3.a_3 = 3 \times 135 = 405$$

$$a_5 = 3.a_{5-1} = 3.a_4 = 3 \times 405 = 1215$$

$$a_6 = 3.a_{6-1} = 3.a_5 = 3 \times 1215 = 3645$$

$$a_7 = 3.a_{7-1} = 3.a_6 = 3 \times 3645 = 10935$$

$$\therefore a_0 + a_1 + \dots + a_7 = 5 + 15 + 45 + 135 + 405 + 1215 + 3645 + 10935 = 16400$$

Alternatively

5, 15, 45, 135, 405, 1215, 3645, 10935 are in Geometric Progression

Common Ratio (r) = 3, a = 5, n = 8

Sum formula in GP = $a(r^n - 1)/(r - 1) = 5 \times (3^8 - 1)/(3 - 1) = 5 \times (2187 - 1)/2 = 10930/2 = 16400$

Statement II

$a_n > 0$, where it is implied that sum of the series will be greater than 0. Evidently, the result cannot be determined.

$\therefore$ Statement I alone can give the answer to the question.

77. Answer: a

Explanation:

Statement I

Cost price of 8 books = selling price of 6 books

$$8/6 = SP/CP = 4/3$$

$$\text{Profit percent} = (\text{SP} - \text{CP}) / \text{CP} \times 100 = (4 - 3) / 3 \times 100 = 33.33\%$$

Statement II

The selling price of each book is Rs.72 and we cannot find the profit percent without the cost price.

∴ Statement I alone can give the answer to the question.

78. Answer: a

Explanation:

Statement I

$$\text{At } x = 2, 4x^3y - \frac{4x^3}{y} = 4 \times 2^3 \times y - 4 \times 2^3 / y = 32y - 32/y$$

The result cannot be determined with just one variable (x).

Statement II

$$\text{At } y^2 = 4$$

$$y = \pm 2$$

Similarly, in this case the result cannot be determined with just one variable (y) with 2 values.

Statement I and II

$$\text{At } x = 2, y = 2$$

$$4x^3y - \frac{4x^3}{y} = 4 \times 2^3 \times 2 - 4 \times 2^3 / 2 = 64 - 16 = 48$$

$$\text{At } x = 2, y = -2$$

$$4 \times 2^3 \times (-2) - 4 \times 2^3 / -2 = -48$$

∴ With statement I and II, we have two results and cannot answer the question and additional information is necessary.

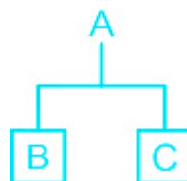
79. Answer: b

Explanation:

By using the symbols in the table given below, we can draw the following family tree:

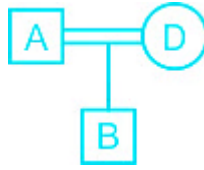
Symbol in Diagram	Meaning
○	Female
□	Male
==	Married Couple
—	Siblings
	Difference of a Generation

(I) B is the brother of C and C is the son of A.



A is either father or mother of B.

(II) A is the husband of D and D is the mother of B.



Clearly, A is the father of B.

Though Statement I can not give the answer, while Statement II alone answers the question in a definite way.

So, statement II alone can give the answer to the question.

Hence, ' **option 2** ' is the correct answer.

80. Answer: c

Explanation:

Assertion (A): India has a tropical monsoon type climate → True

India has a tropical monsoon type climate owing to its geographical relief. Only the lower half of India lies amidst tropical latitudes, as the Tropic of Cancer passes through its center.

Reason (R): India is located exactly between the tropical latitudes. → False

As only the lower half of India lies amidst tropical latitudes, as the Tropic of Cancer passes through its center.

Hence, **(A) is true but (R) is false** .

81. Answer: c

Explanation:

Assertion (A): Food materials should not have been soaked in water for a long time. → True

Food materials should not have be soaked in water for a long time because washing leads to loss of Vitamin B and Vitamin C from the foodstuff.

Reason (R): Washing leads to loss of Vitamin A and Vitamin D from the foodstuff → False

Food materials should not have been soaked in water for a long time because washing leads to the loss of Vitamin B and Vitamin C from the foodstuff and not the loss of Vitamin A and Vitamin D from the foodstuff.

Hence, **(A) is true but (R) is false** .

82. Answer: a

Explanation:

Assertion (A): Red colour of blood is due to haemoglobin → True

Human blood is red because of the protein hemoglobin, which contains a red-colored compound called heme that's crucial for carrying oxygen through your bloodstream. Heme contains an iron atom that binds to oxygen; it's this molecule that transports oxygen from your lungs to other parts of the body.

Reason (R): Haemoglobin is a red pigment. → True

It is true and the reason is defined.

Hence, **Both (A) and (R) are true and (R) is the correct explanation of (A)** .

83. Answer: c

Explanation:

The description is as follows:

Option		Description
1.	Eagle	Eagle is a bird who can fly.
2.	Peacock	Peacock is a bird who can fly.
3.	Ostrich	Ostrich is a flightless bird.
4.	Hawk	Hawk a bird who can fly.

All options except 'Ostrich' are name of birds that can fly, but Ostrich is a flightless bird.

Hence, ' **Ostrich** ' is the odd one out.

84. Answer: b

Explanation:

The description is as follows:

Option		Description
1.	September	30 days
2.	May	31 days
3.	June	30 days
4.	November	30 days

Clearly, May is the odd one out as it has 31 days and the other months have only 30 days.

Hence, 'May' is the odd one out.

85. Answer: d

Explanation:

The pattern followed here is:

Alphabets	A	B	C	D	E	F	G	H	I	J	K	L	M
Positional value	1	2	3	4	5	6	7	8	9	10	11	12	13
Positional value	26	25	24	23	22	21	20	19	18	17	16	15	14
Alphabets	Z	Y	X	W	V	U	T	S	R	Q	P	O	N

According to the alphabetical positions of the letters,

1. EJO $\rightarrow$ E + 5 = J; J + 5 = O

2. $HMR \rightarrow H + 5 = M; M + 5 = R$

3. $DIN \rightarrow D + 5 = I; I + 5 = N$

4. $LPT \rightarrow L + 5 = Q \neq P; P + 5 = U \neq T$

Hence, 'LPT' is the correct answer.

86. Answer: a

Explanation:

The logic is:

First digit $\times$ Third digit = Second digit

1. $273 \rightarrow 2 \times 3 = 6 \neq 7$

2. $133 \rightarrow 1 \times 3 = 3$

3. $155 \rightarrow 1 \times 5 = 5$

4. $221 \rightarrow 2 \times 1 = 2$

Hence, '273' is the odd one out.

87. Answer: d

Explanation:

The logic is:

Number = $n^2 + n$

1. $6 \rightarrow 2^2 + 2 = 4 + 2 = 6$

2. $20 \rightarrow 4^2 + 4 = 16 + 4 = 20$

$$3. 42 \rightarrow 6^2 + 6 = 36 + 6 = 42$$

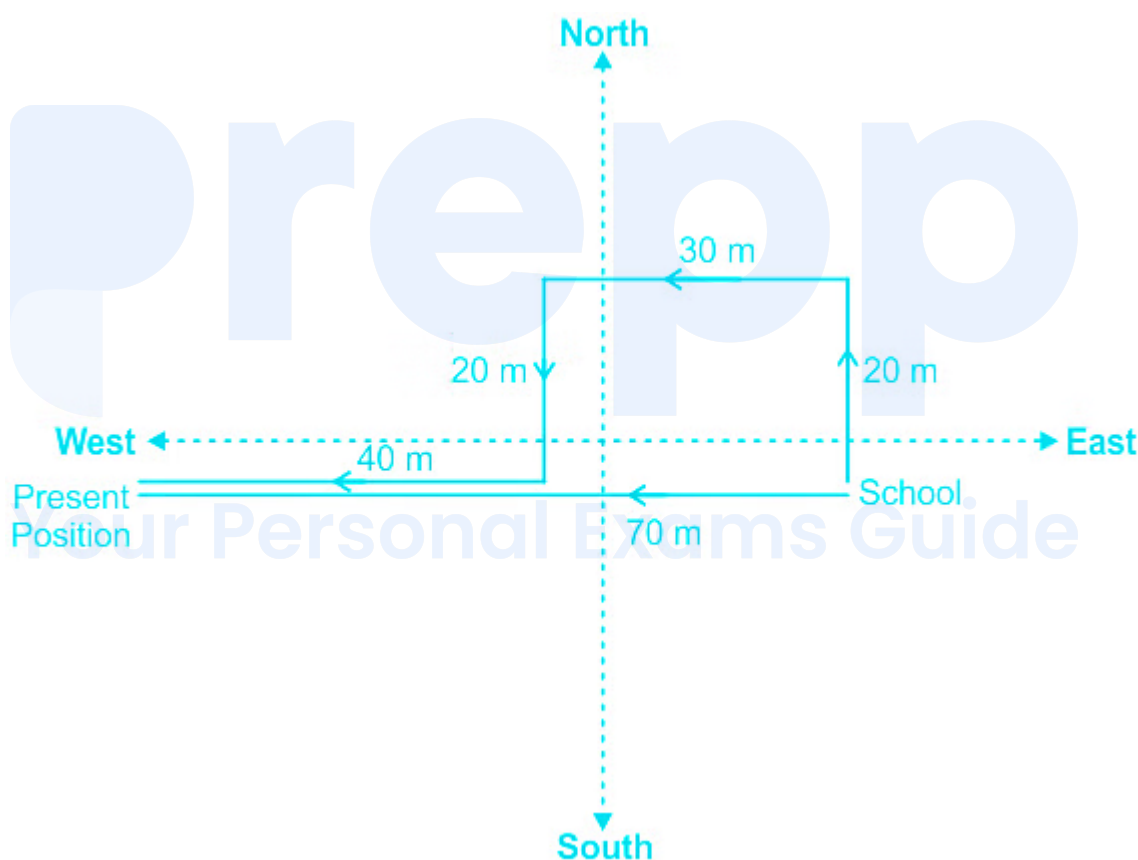
$$4. 74 \rightarrow 8^2 + 8 = 64 + 8 = 72 \neq 74$$

Hence, '74' is the odd one out.

88. Answer: c

Explanation:

According to given conditions, the direction and distance diagram is as follows,



The nearest distance from the school to his present position = $(30 + 40) \text{ m} = 70 \text{ m}$

And the direction of his present position from the school is west.

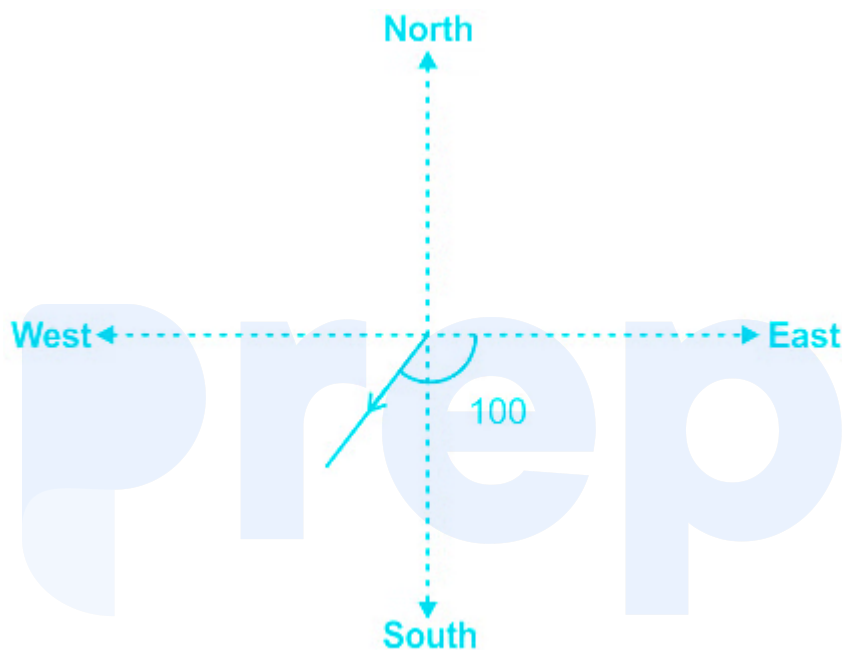
Hence, '70 meters, West' is the correct answer.

89. Answer: b

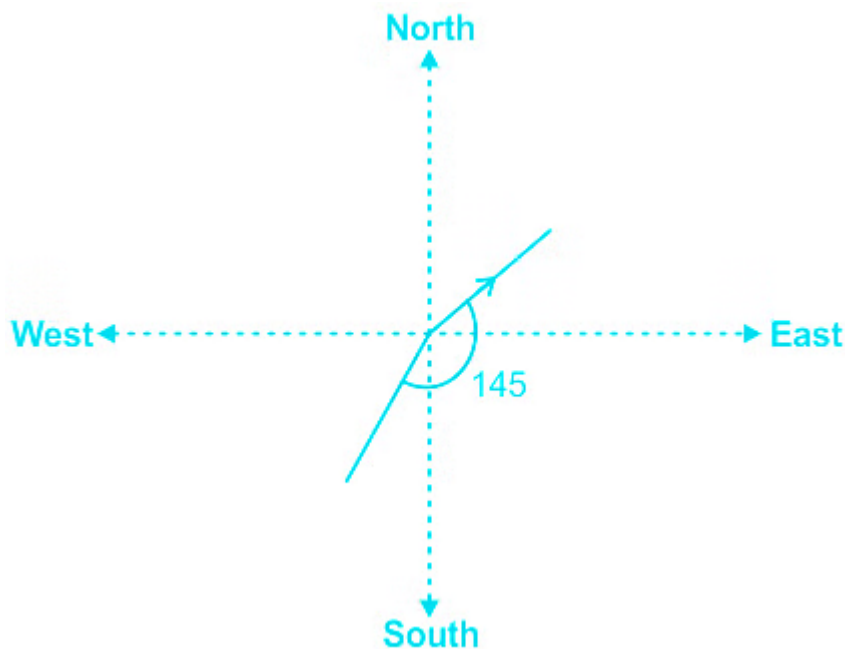
Explanation:

According to the given conditions,

1) Sunil is facing East. He turned 100° in the clockwise direction.



2) Then turned 145° in the anti-clockwise direction.



Sunil is facing North-East direction now.

Hence, ' **North-East** ' is the correct answer.

90. Answer: d

Explanation:

The pattern followed here is:

Alphabets	A	B	C	D	E	F	G	H	I	J	K	L	M
Positional value	1	2	3	4	5	6	7	8	9	10	11	12	13
Positional value	26	25	24	23	22	21	20	19	18	17	16	15	14
Alphabets	Z	Y	X	W	V	U	T	S	R	Q	P	O	N

Letters of the word are coded according to the equivalent opposite letter of a particular letter of the word.

R	E	C	T	A	N	G	L	E
I	V	X	G	Z	M	T	O	V

Similarly,

S	P	H	E	R	E
H	K	S	V	I	V

Hence, ' HKSVIV ' is the correct answer.

91. Answer: c

Explanation:

The pattern followed here is:

Alphabets	A	B	C	D	E	F	G	H	I	J	K	L	M
Positional value	1	2	3	4	5	6	7	8	9	10	11	12	13
Positional value	26	25	24	23	22	21	20	19	18	17	16	15	14
Alphabets	Z	Y	X	W	V	U	T	S	R	Q	P	O	N

According to the alphabetical positions of the letters,

$$\text{PINK} \rightarrow \text{P (16)} + \text{I (9)} + \text{N (14)} + \text{K (11)} = 16 + 9 + 14 + 11 = 50$$

$$\text{RED} \rightarrow \text{R (18)} + \text{E (5)} + \text{D (4)} = 18 + 5 + 4 = 27$$

Similarly,

$$\text{BLACK} \rightarrow \text{B (2)} + \text{L (12)} + \text{A (1)} + \text{C (3)} + \text{K (11)} = 2 + 12 + 1 + 3 + 11 = 29$$

Hence, ' 29 ' is the correct answer.

92. Answer: b

Explanation:

Name	Called
Strawberry	Apple
Apple	Grape
Grape	Mango
Mango	Pomegranate
Pomegranate	Guava

Mango is a yellow fruit and Mango is called pomegranate.

Hence, ' **Pomegranate** ' is the correct answer.

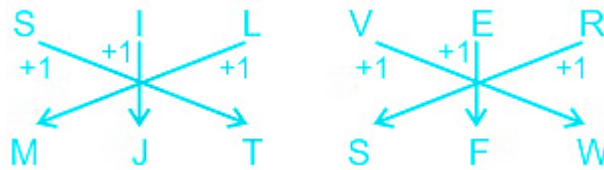
93. Answer: b

Explanation:

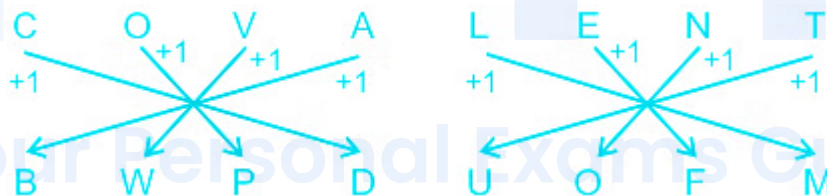
The pattern followed here is:

Alphabets	A	B	C	D	E	F	G	H	I	J	K	L	M
Positional value	1	2	3	4	5	6	7	8	9	10	11	12	13
Positional value	26	25	24	23	22	21	20	19	18	17	16	15	14
Alphabets	Z	Y	X	W	V	U	T	S	R	Q	P	O	N

According to the alphabetical positions of the letters,



Similarly,



Hence, ' BWPDUOFM ' is the correct answer.

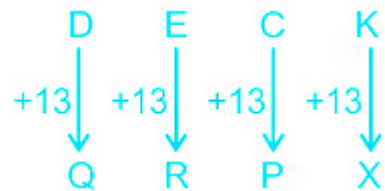
94. Answer: d

Explanation:

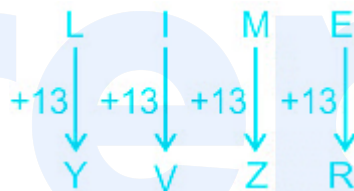
The pattern followed here is:

Alphabets	A	B	C	D	E	F	G	H	I	J	K	L	M
Positional value	1	2	3	4	5	6	7	8	9	10	11	12	13
Positional value	26	25	24	23	22	21	20	19	18	17	16	15	14
Alphabets	Z	Y	X	W	V	U	T	S	R	Q	P	O	N

According to the alphabetical positions of the letters,



Similarly,



Hence, 'YVZR' is the correct answer.

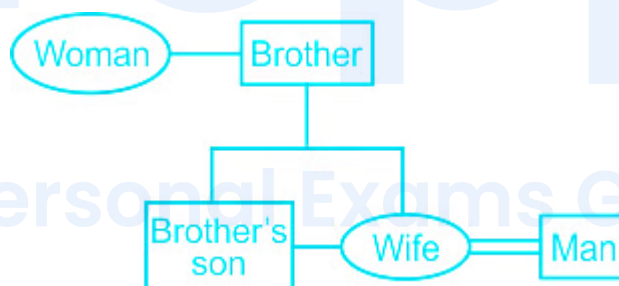
95. Answer: a

Explanation:

By using the symbols in the table given below, we can draw the following family tree:

Symbol in Diagram	Meaning
○	Female
□	Male
=	Married Couple
—	Siblings
	Difference of a Generation

The only son of the woman's brother is the nephew of the woman. The wife of the man is the sister of the woman's nephew. So, the sister of the woman's nephew is the niece of the woman.



Clearly, the woman is the aunt of the man's wife.

Hence, ' **Aunt** ' is the correct answer.

96. Answer: b

Explanation:

By observing all the categories, especially category III and information given about the blood donation, Anthony will be referred to the secretary as he has not

completed 60 years of age but donates blood once in a year.

∴ The candidate will be referred to the secretary

97. Answer: c

Explanation:

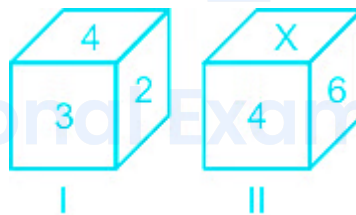
By observing all the categories and particularly category II, Anitha is a national player in Table Tennis but no information is specified about her age.

∴ The candidate is not eligible for concession

98. Answer: c

Explanation:

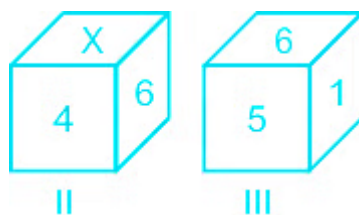
From Cube I and II we have:



As 4 is common on both the cubes, keeping it constant and then rotating in clockwise direction, we get the faces opposite to each other.

4	2	3
4	X	6

Again, from Cube II and III, we have:



As 6 is common on both the cubes, keeping it constant and then rotating in clockwise direction, we get the faces opposite to each other.

6	4	X
6	1	5

Comparing both the results, we get:

6	4	X = 2
3	1	5

Hence, '2' is the correct answer.

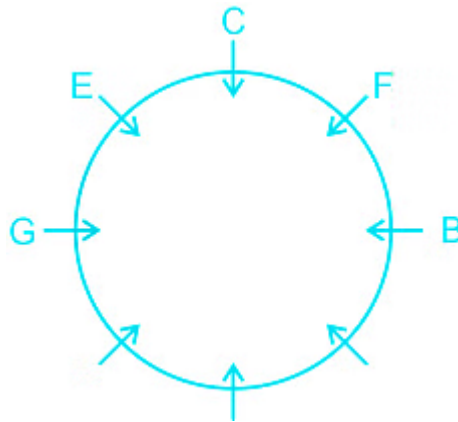
99. Answer: c

Explanation:

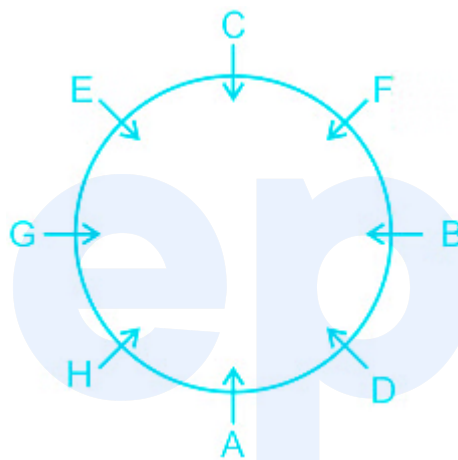
Persons – A, B, C, D, E, F, G and H are eight friends sitting around a circular table facing towards its centre as follows:

(ii) F is on the immediate right of B and G is a neighbour of E.

(iii) C is in between E and F



(i) H is on the immediate left of A but is not a neighbour of D or E



D is on the immediate left of B.

Hence, 'On the immediate left of B' is the correct answer.

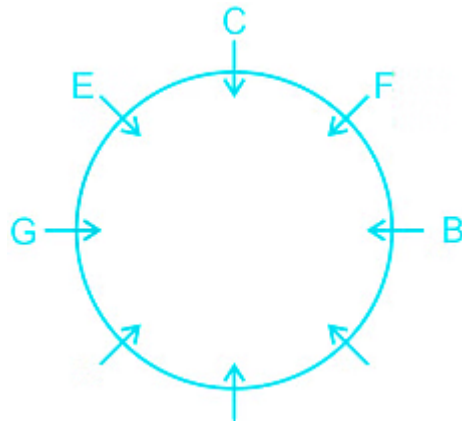
100. Answer: c

Explanation:

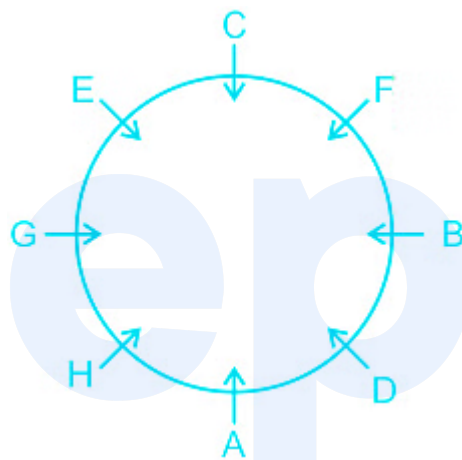
Persons - A, B, C, D, E, F, G and H are eight friends sitting around a circular table facing towards its centre as follows:

(ii) F is on the immediate right of B and G is a neighbour of E.

(iii) C is in between E and F



(i) H is on the immediate left of A but is not a neighbour of D or E



1.

E is between F and B → False

2. F is a neighbour of G → False

3. G is in between H and E → True

4. H is between A and D → False

Hence, ' **G is in between H and E** ' is the correct answer.